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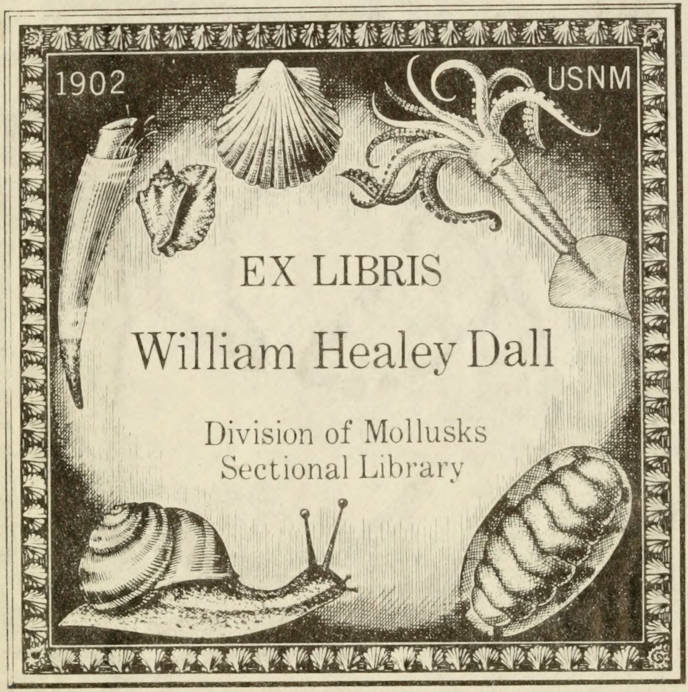

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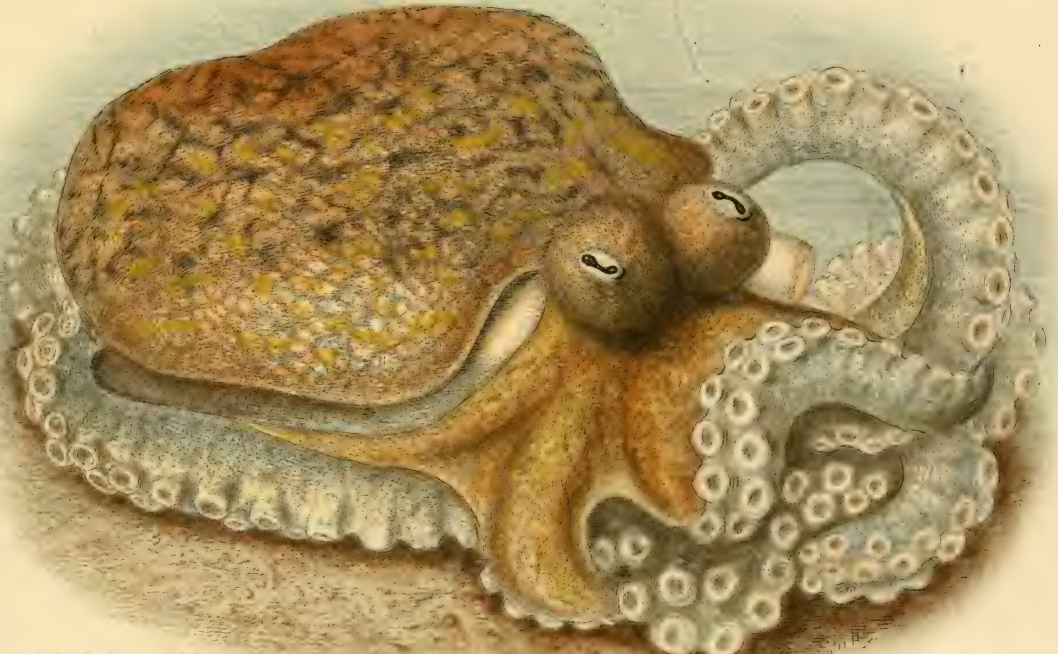

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Family II. APLYSI'IDÆ, (*Aplysidæ*) D'Orbigny.

Body slug-like, semioval when at rest, but capable of considerable extension, of a fleshy substance: *mantle* enveloping the upper portion of the body, and covering the greater part of the shell in those genera which have one: *head* snout-shaped, prominent: *mouth* vertical, armed with large and strong jaws: *odontophore* having in the middle a single row of rhachidal teeth and on each side a row of numerous uncinate or hook-like teeth: *tentacles* apparently 4, separate; the front or false pair resemble lips, and the hinder or true pair are semitubular and not unlike the ears of a quadruped: *eyes* small, sessile, in front of the hinder or true tentacles: *foot* large, attached to the body throughout its whole length; it expands on each side, so as to form two lobes, which interfold over the back and are in many genera used for swimming: *gills* placed in a particular cavity or receptacle towards the posterior part of the back, and protected by the mantle: *gizzard* composed of several cartilaginous plates: *vent* placed behind the branchial cavity. Each individual is of both sexes: the organs of generation are separated and situate at the opposite extremities of the body.

Shell present in some genera only, usually internal and for the most part concealed by the mantle; it is shield-shaped, thin, and slightly convolute at the smaller end, which is thickened and furnished inside with a small tubercle or projection: *spire* extremely short and terminal, coated over and concealed in the adult, but heterostrophe in the fry: *mouth* extending the whole length of the shell.

The type of the present family is the famous sea-hare, about which I will say something in its proper place. Several genera have been described; we have *Aplysia* only. Although these animals resemble great slugs in their general aspect, they have properly but a single pair of tentacles, which are placed behind the eyes and are not unlike the ears of a hare; the two processes in front, usually considered tentacles, are expansions of the snout as in *Jeffreysia.* Their food mainly consists of seaweeds; but they eat also other Mollusca, as well as small Crustacea and Annelids; they probably inhabit only the laminarian zone. No member of this or the next two families appears to be known on the other side of the Atlantic. While copulating, the individual which performs the functions of the male is partly enveloped in the side folds of the other's foot on its back. They are, like rabbits, salacious and prolific. The spawn has been aptly called by Delle Chiaje "vermicelli di mare," from its resemblance to the popular eatable of the Neapolitans. The gills are supplied with water through the oval aperture of the mantle where the shell is uncovered. The varied colour which ornaments most of this family is quite superficial and is easily removed by even a slight degree of friction. Rang's 'Histoire naturelle des Aplysiens' is elaborate and beautifully illustrated, but it is now forty years old. Another monograph, suited to the present state of science, is much wanted. The family name has been spelt in many different ways (besides those which I have given) by Lamarck, De Blainville, Deshayes, Gray, and Agassiz.

Genus APLY'SIA*, (*Laplysia*) Linné. Pl. I. f. 1.

Body smooth and lubricous.

Shell triangular or squarish; it is composed of two layers, the outer one being horny or membranous, and the inner one semicalcareous.

Apparently unknown to Aristotle. The Greeks afterwards called this animal λαγωὸς θαλάσσιος, the Romans *lepus marinus,* the English "sea-hare," the French

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* Perhaps by mistake for a kind of sponge described by Aristotle, and called by him ἀπλυσία from the impossibility of cleansing it.

DSI

"lièvre de mer," "imbriago," "tête d'âne," "chat de mer," "limace de mer," "pichevin," "pisse de mer," and "pisse-vinaigre," the Italians "lepre marina" and "cesto del mare," the Spaniards "liebre de la mar," and the inhabitants of Martinique "baril de vin." From time immemorial sailors and fishermen of all countries have given the names of land animals to those of the sea. Wonderful tales used to be told of the more than poisonous qualities of the *Aplysia*. Pliny, Ælian, and especially Aldrovandi collected all these absurd notions. One was that if the animal were touched, even with a walking-stick, the danger would be not less than from the look of a basilisk; another was that it caused baldness; and a third that pregnant women miscarried at the sight of this horrid creature. In those days the science of Natural History consisted rather of such idle gossip than of patient investigation. Zoology, indeed, was not always a safe pursuit. Apuleius was about to marry a rich widow, named Pudentilla, when her relations (in order to keep her money in the family) accused him before the Proconsul Claudius Maximus on a charge of sorcery and poisoning; the chief proof consisted in his having employed fishermen to procure for him an *Aplysia*. He had considerable difficulty in establishing his innocence. Cuvier has satisfactorily shown that the *Aplysia* is quite harmless, and that it did not deserve the bad character given to it by the ancients; he says truly that fishermen have always had a fancy to attribute mischievous properties to those marine animals which are of no use as the food of man. I would remark, however, by way of parenthesis, that the *Aplysia* is not quite inoffensive, as any one may be convinced by handling it; the smell is insufferably nauseous. This and its slabby appearance are certainly enough to take away the appetite of any civilized being; but M. Lesson states that one kind is eaten raw and esteemed a delicacy by the natives of the Society or Friendly Isles. The *Aplysiæ* secrete occasionally a whitish slime; and many of them emit also a copious and beautiful purple fluid. The former issues from the whole surface of the body, and the latter from glands or nucleated cells in the edge and inner surface of the mantle. Cuvier suggested the connexion between this purple fluid and the kidney; if it be of a urinary nature, some of the vernacular names quoted by French naturalists are not inappropriate. Apuleius noticed the cartilaginous gizzard. According to Fischer "on rencontre quelquefois au large des Aplysies nageant avec rapidité;" and I have observed their activity in creeping. Although often living between tide-marks, their soft and delicate bodies confronting the cutting blasts of wintry storms, they seem to be hardy

> "creatures,
> Whose naked natures live in all the spite
> Of wreakful heaven; whose bare unhoused trunks,
> To the conflicting elements exposed,
> Answer mere nature."

The colour of the animal is a variable character, and can seldom be relied on for specific distinction. Risso made at least four species out of our common *A. punctata*. The rudimentary shell serves, like that of the land-slugs, to protect the vital organs. It has been found, although rarely, in some of the upper tertiaries.

Linné at first placed it in the parasitic genus *Lernæa*, and afterwards in *Tethys*; but, on Bohadsch pointing out the incongruity of both these allocations, he proposed for its reception the genus *Laplysia*. This last name was altered by Gmelin to *Aplysia*, which is now in general use.

1. Aplysia puncta'ta*, Cuvier.

A. punctata, Cuv. Annales du Muséum (1803), ii. p. 295, pl. i. f. 2–5.
A. hybrida, F. & H. iii. p. 554, pl. cxiv. f. f. 4, and (animal) pl. YY. f. 1.

Body extremely flexible, brown of various shades, with a tinge of purple, usually marked with black and white round spots (some of which are arranged in star-like clusters, or the spots become minute specks), and finely marbled or tessellated by dark lines: *mantle* folded inwards on the back to admit water into the gills: *head* extensile, having a tentacle-shaped flap at each corner, which hangs downwards: *mouth* capacious, with large lips: *tentacles* cylindrical, rather long and thin, resembling the ears of a hare, of a darker colour towards their tips: *eyes* small, partly imbedded in the skin, so as to give the appearance of their being encircled with a white iris: *foot* very large; the lower part is narrow, rounded in front and bluntly pointed behind; dorsal lobes sometimes raised into a hump, with their edges of a paler hue: sole light yellowish-brown: *male organ* curved, on right-hand side. L. 4–6.

Shell triangular, with a small apex and a broad base, convex and sometimes gibbous, horny, rather thin, opaque and glossy: inner layer firmly united with the outer layer and containing but little calcareous matter except in aged specimens: *sculpture*, several slight and irregular lines, which radiate from the apex to the outer edge; there are also numerous microscopic and scratch-like longitudinal lines and very minute and close-set concentric striæ, besides the usual marks of growth: *colour* yellowish-brown or tawny, sometimes dark reddish-brown: *spire* exceedingly small, concealed by a thick deposit from the hinder lobe of the mantle, representing an obliquely recurved or involute apex: *mouth* occupying the whole of the underside; dorsal margin gently curved and sometimes forming a shoulder on a level with the apex or raised above it: inner margin, on the opposite side, short and more or less incurved; front margin dilated and rounded; all the edges are membranous and fold back in the dried shell. L. 1·15. B. 0·85.

Habitat: Laminarian zone, among seaweeds, on every part of the British and Irish coasts; occasionally between tide-marks. It is generally distributed through the European seas, from Upper Norway (Sars) to the Canaries (M'Andrew), as well as in the Mediterranean and Adriatic.

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* Spotted like dice.

Our common *Aplysia* is gregarious, apparently for the principal reason that keeps herds and flocks together—food, not mutual protection, and still less society. Dr. Johnston fed it on *Fucus palmatus* and *Chrondrus crispus.* I observed one individual voiding spines of an *Aphrodita.* This mollusk is very tenacious of life. I tried to preserve one in glycerine; and for the sake of economy I half filled the vessel with fresh water. It was smothered by the glycerine, and seemed dead; but on falling into the lower stratum of water, it revived and lived there for several minutes. It swims, in a reversed position, on the under surface of the water. The purple dye is emitted during life only. Spawn-case gelatinous, of a pinkish hue, thread-like, and irregularly convoluted; ova white and very numerous, lying in the middle. The embryonic shell is globular; it becomes the apex in after-growth, being persistent, as in *Teredo.* *Truncatulina lobatula* occurs sometimes on the back of shells taken from living individuals, proving that this part is exposed. Unfortunately there is no typical specimen of *A. punctata* in the collection of the Jardin des Plantes. Montagu, Fleming, and Alder recognized the name given by Cuvier. That of *hybrida,* proposed by the late Mr. James Sowerby, is subsequent by three years to *punctata,* and is besides clearly erroneous. Rathke's species (*A. rosea*), described as about an inch long, from deep water off Christiansund, was published before either of the above; but the peculiar colour, rose-red, has not been noticed in any other European *Aplysia,* and makes the specific agreement doubtful. At all events the last-mentioned name may be regarded as obsolete. Among names of later date are *mustelina* of Davies, in the 2nd edition of Pennant, *Cuvieri* of Delle Chiaje, *vulgaris* of De Blainville, and *varians* of Leach; the young is his *Esmia Griffithsiana* and the *A. nexa* of Thompson.

2. A. DEPI′LANS*, Linné.

Laplysia depilans, Linn. S. N. p. 1082.

BODY tumid, reddish-brown or liver-coloured, with irregular and variable greyish blotches or spots: *head* gibbous, with a long and thick neck resembling that of an elephant; labial processes or false tentacles large, broad, and fringed, placed horizontally: *tentacles* nearly cylindrical, convolute and erect: *eyes* very small and indistinct, pale blue, placed on each side of the head in front of the tentacles: *foot* somewhat broader than the rest of the body, forming an enormous flap on each side, squarish in front and bluntly pointed behind: *gills* slightly protruding beyond the margin of the pallial orifice. L. 10–12.

SHELL broadly triangular, depressed, thin, opaque, and glossy; the outer layer is skin-like and easily separated from the inner layer, which being calcareous often cracks and peels off: *sculpture*, several slight lines radiating from the apex to the outer edge, and intermediate close-set, very fine and microscopic longitudinal striæ, besides equally numerous and irregular concentric marks of growth: *colour* pale brownish-yellow: *spire* and *mouth* as in the other species; but the dorsal margin is more rounded. L. 2. B. 1·5.

HABITAT: Guernsey in a few fathoms, outside the new harbour, among *Zostera marina*. I received a specimen from the late Mr. Gallienne; but it was then dead and distended with water, and all the parts were much contracted. The contents of its stomach were comminuted seaweeds. From his account, it measured 12 inches in length when crawling, and weighed 29 oz. The liquid dye was pale blue, owing probably to the animal being in a very sickly state. Mr. Cooper informs me that he knows of several specimens which have been found at Guernsey during the last two years. There is a shell of this species in the British Museum, presented by Mr. Gosse, with a memorandum that it was from an *Aplysia,* about 8 inches long, taken at Torquay. *A. depilans* is common on the Atlantic coast of France from Morbihan southwards, and throughout the Mediterranean and Adriatic. I met with great numbers of it at a low tide near Rochelle in 1830. Mr. Jabez Hogg, in a valuable and beautifully illustrated paper on the lingual membrane of Mollusca (Trans. Roy. Micr. Soc. xvi.), has shown the difference between the dentition of this and the last species. *A. punctata* has 70 rows of divergent teeth, the median and laterals being conical and unicuspid; in *A. depilans* there are but 40 rows, and the teeth are broad and tricuspid; the laterals in each are numerous and similar.

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* So named from its reputation of causing baldness.

It does not appear that Linné knew this species, except from the accounts of older writers. The first authority cited by him is Rondelet, who described his *Lepus marinus* from the coast of Languedoc. The *Lernæa* of Bohadsch, from Naples, is evidently the same kind. The specific name *depilans* was derived from the celebrated treatise of Dioscorides on the materia medica, in which he says (lib. ii. c. 20) that the λαγωὸς θαλάσσιος, when either pounded by itself or smeared with an ἀκαλύφη (*Medusa*), removes hairs. It is the *Dolabella lepus* of Risso, *A. leporina* of Delle Chiaje, and *A. Petersoni* of Gray.

Family III. PLEUROBRAN'CHIDÆ, Forbes and Hanley.

Body tortoise-shaped or semioval, fleshy: *mantle* enveloping the upper part of the body, and forming a veil in front: *head* proboscidiform, retractile, not prominent, but partly concealed by the pallial veil: *tentacles* 2, close together, folded so as to appear tubular and slit down the middle: *eyes* sessile, at the base of the tentacles: *foot* large, expanded at the sides: *gills* composing a long plume with a double row of leaflets; it is free towards the point, and more or less protruded; its stalk is attached between the junction of the mouth and foot on the right-hand side. Sexes united, the organs of generation being nearly contiguous.

Shell when present wholly external or internal, oval or conical: *spire* visible, minute, dextrorsal: *mouth* very large and open.

A small but peculiar family, and widely distributed. It was included by Lamarck in his 'Phyllidiens,' along with *Chiton* and *Patella.*

Genus PLEUROBRANCHUS*, Cuvier. Pl. I. f. 2.

Body more or less depressed.

Shell internal, oval or ear-shaped: *spire* nearly terminal.

This genus was founded by Cuvier in the 'Annales du Muséum d'Histoire Naturelle' for 1805, his type being *P. Peronii,* an inhabitant of the Indian Ocean. In 1815 Montagu proposed another generic name, *Lamellaria,* which is now applied to mollusca belonging to the *Velutina* family. In my account of the genus *Lamellaria* (vol. iv. p. 234) I stated that *Pleurobranchus* was "afterwards" established by Cuvier. Such is the case with regard to the date of publication of his celebrated 'Mémoires,' which was in 1817; Montagu's paper appeared two years previously. Dr. Woodward detected spicula in the mantle; this confirms the generally received opinion that *Pleurobranchus* is allied to the Nudibranchs. It resembles *Doris* in shape. The nature of its food is not known. Its alimentary system is complicated, and said to consist of no less than four stomachs.

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* From its gills or branchiæ being placed at the sides.

De Blainville called it *Berthella,* Gray *Pleurobranchia,* and Leach *Cleantus* and *Oscanius.*

1. PLEUROBRANCHUS MEMBRANA'CEUS*, Montagu.

Lamellaria membranacea, Mont. in Trans. Linn. Soc. xi. p. 184, t. 12. f. 3, 4. *P. membranaceus,* F. & H. iii. p. 558, pl. cxiv. F. f. 5, and (animal) pl. XX. f. 3.

BODY tortoise-shaped or roundish-oval, thick, forming two disks, one above and the other below—usually pale yellow, with reddish-brown streaks or blotches; but the shades of colour are variable: *mantle* notched in front and behind, studded with yellow papillæ or tubercles of different sizes, "and in their interstices a red-brown colour meanders in various breadths and irregular blotches, interspersed with cloudings of pale yellow flakes;" the groove or space between the mantle and foot is large and deep: *head* a thick muzzle, springing from the centre of the pallial membrane, which is strongly auricled, pale blue on the under surface, and sprinkled on the upper with flake-white and red points: *tentacles* short, cloven though apparently tubular, "united at their origins, but diverging to their points, marked with close-set lines and snow-white dots:" *eyes* indistinct, imbedded in the centre of the bases of the tentacles, and therefore nearly contiguous: *foot* extremely flexible, and probably serving for natation as well as for crawling: sole pale yellow, marked with a multitude of irregular anastomosing deeper-yellow lines: *gill-plume* "splendid," somewhat like an ostrich-feather, nearly half the length of the body, floating free for about a quarter of an inch; the leaves are finely ciliated. L. 4. (Clark.)

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* Membranous.

Shell ear-shaped, membranous, semitransparent, glossy and iridescent; it is composed (as in *Aplysia*) of two layers, the outer being skin-like, and the inner semicalcareous and separable: *sculpture*, numerous fine concentric or transverse plaits or folds, and microscopic scratch-like lines in every direction; there are also a few irregular longitudinal wrinkles, caused by an unequal contraction of the shell in drying: *colour* pale reddish-brown or tawny: *spire* extremely small and obscure, placed on the lower side near the narrower end; it is composed of two whorls, and coated over with a shelly enamel in large specimens: *mouth* occupying nearly the whole of the lower surface; dorsal margin rounded and somewhat thickened; inner margin almost straight; outer or ventral margin dilated. L. 2. B. 1·25.

Habitat: Coralline zone, on the Devon coast (Montagu and others); Falmouth and Helford (Hockin); Cork Harbour (Humphreys); Arran and Birterbuy, co. Galway (Barlee). It seems to be equally local beyond our seas. I am not aware of any extra-British habitat except the north of France (Daniel, Reynaud, and Taslé), Naples (Costa), and Trieste (Stossich). Specimens from the last mentioned place are much smaller than ours. It may, however, be the *P. testudinarius* of Cantraine, *P. mamillatus* of Schultz, as well as *P. Forskålii* and *P. tuberculatus* of Delle Chiaje, although the shell is described by Philippi as "minima." Possibly the spiral portion only was extracted from the animal. Leach named our species *Oscanius argentatus*.

2. P. plu'mula*, Montagu.

Bulla plumula, Mont. Test. Br. (i.) p. 214, t. 15. f. 9, and vign. 2. f. 5.
P. plumula, F. & H. iii. p. 559, pl. cxiv. f. f. 6, 7, and (animal) pl. XX. f. 1, 2.

Body semioval, gelatinous, lemoncolour, or whitish with a slight tinge of yellow, marked with flake-white spots, minutely tessellated all over with faint lines, and covered with a few scattered pustules: *mantle* extending on every side beyond the foot, of a reticulated and apparently porous texture, and occasionally puckered or raised in folds; it is rather thin on the back and thickened at its edges, which are often wavy and wrinkled; and it has a small notch on the right-hand side, as in *Lamellaria*; the edges of the mantle are irregularly studded with microscopic tubercles: *head-veil* or hood semicircular, forming a bluntly pointed flap at each side; it is carried in advance of the foot: *head* short: *mouth* round and open: *tentacles* proportionally large, but rather short, diverging at an angle of about 45°, and projecting outwards; they are half open down the middle; tips obliquely truncated: *eyes* black, partly imbedded in the outer integument and not always visible, placed close together on the neck between the tentacles, at their base: *foot* oblong, expanded towards the sides, and sinuous or wavy at the edges, occupying about half the space of the mouth; it is squarish or gently curved and double-edged in front, and tapers to a rounded point behind: *gill-plume* placed in the divisional groove between the mantle and foot, not always protruded, and never beyond the edge of the mantle, composed of about 20 sloping strands or pectinations; it is in some individuals reddish-brown, and in others of the same colour as the rest of the body: *liver* brown: *ovary* creamcolour. L. 1.

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* A little feather; from the gill-plume.

Shell oval with a squarish outline, sometimes oblong, more solid and compact than the last species, glossy and partially iridescent: *sculpture*, microscopic and close-set longitudinal striæ, which are more conspicuous near the spire, and are interrupted by the lines of growth, so as to form a series of short rows; the lines of growth are irregular and rather numerous, and many specimens have also a slight furrow which runs obliquely from back to front: *colour* pale reddish-brown or tawny, rarely milk-white: *spire* extremely small but distinct, twisted sideways, and placed at a short distance from the inner margin at the posterior or smaller end; it consists of two whorls, the first of which is tubercular and somewhat prominent: *mouth* open throughout; dorsal margin gently curved, flat, slightly reflected, and thickened; inner margin short; ventral margin long and nearly straight. L. 0·6. B. 0·325.

Habitat: Mostly under stones at low-water mark, but occasionally in the laminarian and coralline zones, on many parts of our eastern and western coasts from Berwick and the Hebrides to Guernsey; Dublin Bay (Kinahan); Bantry (Norman); Malbay, co. Clare (Harvey): local and not common. It appears to have an extensive range in the European Seas, from Bohuslän in Sweden (Lovén), along the northern and western shores of France, and on both sides of the Mediterranean, as well as in the Adriatic, to the Ægean (Forbes), at depths varying from 27 to 40 f.

"When first taken, the animal creeps quickly and with great vivacity" (Clark). "Like the land-slug, it progresses by obscure undulatory motions of the foot; but it justly claims the 'bad preeminence' of being superior in sluggishness and tardiness" (Johnston). According to Lacaze-Duthiers it does not shun the light when placed in captivity, and it often comes to the surface of the water; if disturbed it contracts and rolls itself into a ball, or closely and strongly adheres by the foot; it approaches the shore to deposit its spawn, which is formed in ribbon-like and spirally arranged masses (resembling those of *Doris*), several of these masses being deposited by the same individual. He supposes the tentacles are olfactory organs, as Hancock believed is the case with the *Bullidæ*. In the mantle, foot, and gill-plume of *P. plumula* Dr. Johnston detected "many small crystalline spicules of carbonate of lime: these are colourless, short, cylindrical, and rounded at both ends;" and they are irregularly disposed, as in the *Doris* family. He says the present species feeds on seaweeds. The buccal or maxillar plates are large and regularly reticulated, like the compound eyes of certain insects. Mr. Jabez Hogg likens the odontophore to that of some Pulmoniferous mollusks, and he describes the dentition thus:—"Median small, slightly hooked; uncini numerous simple hooked teeth, arranged in divergent rows throughout." The mandible is horny and has "numerous rows of teeth, armed with five or more finely pointed spines: viewed in section, it presents a beautiful tessellated arrangement."

Synonyms:—*P. aurantiacus*, Risso, *Berthella porosa*, De Blainville, *P. perforatus*, Philippi, and probably *P. elongatus*, Cantraine. *P. stellatus* of Risso appears to be the young; and this state I also consider the *P. sideralis* of Lovén, judging from an examination of his typical specimen. Forbes very briefly described as Ægean *P. limacoides*, *P. calyptræoides*, *P. scutatus*, and *P. sordidus*, some of which may also be *P. plumula*; but his descriptions are too much alike to distinguish the species, and he did not mention the shells.

The characters of the order Pleurobranchiata, given in the 3rd volume, p. 200, require amendment. Instead of the gills invariably forming a single row, as in the *Bullidæ*, the following family has no less than three rows; and in the succeeding family there are two rows of branchial leaflets, placed one on each side of the body.

Family IV. RUNCI'NIDÆ, (*Runcinadæ*) Gray.

Body minute, slug-like, depressed: *mantle* separated from the foot by a deep groove: *tentacles* none: *eyes* sessile, placed far apart towards the sides of the anterior part of the mantle: *foot* elongated: *gills* consisting of three small plumes, which lie under the mantle near its hinder margin: *gizzard* testaceous.

Shell none.

Genus RUNCI'NA*, Forbes. Pl. I. f. 3.

This genus being the only one known, it is unnecessary to repeat the description of the family.

RUNCINA HANCOCKI†, Forbes.

Pelta or *Limapontia*? sp., Alder & Hancock in Ann. & Mag. N. H. xviii. p. 289, pl. iv. f. 1–3. *R. Hancocki*, F. & H. iii. p. 612, pl. CCC. f. 2.

BODY smooth, more or less clothed with microscopic vibratile cilia: *mantle* a little indented in front, nearly straight at the sides, and slightly rounded behind: *colour* black, sprinkled with minute points of brown, except at the front and rear, which are buff and fawncoloured: *eyes* rather large, each surrounded by a pale ring; behind the eyes is a curved line of small white specks: *foot* yellowish, tinged with brown or black, and marked with a few flake-white spots; it is rounded in front, the sides are almost parallel and broader than the mantle, towards which they are usually folded up; tail or extremity of the foot extended one-fourth of the length of the body behind the vent: *gill-plumes* 3, small, slightly pinnate, near the vent, and generally projecting a little beyond the mantle: *vent* beneath the posterior margin of the mantle (Alder and Hancock). L. 0·2. B. 0·1.

HABITAT: On Confervæ, in pools near high-water mark, at Torquay (Alder and Hancock); Belmont Bay near Weymouth (Thompson and Gray). Mr. W. Thompson informs me that it is very abundant in rock-pools at low-water of spring tides, among Confervæ (*Ceramium strictum, C. rubrum,* and *C. Deslongchampii*), apparently feeding on the Diatoms which swarm on these delicate seaweeds. Clyde district, in rock-pools, with *Limapontia nigra* (Norman).

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* A rural goddess.

† Commemorative of Mr. Albany Hancock, whose labours on the Nudibranchs, in conjunction with Mr. Alder, are especially famous.

Specimens which Mr. Thompson kindly sent me from Weymouth in a bottle of sea-water with Confervæ, were dark purplish-brown with minute round spots of yellow and a streak of the former colour on the tail; the sides of the front portion of the mantle, as well as the hinder portion and the sides of the tail, were buff; the eyes were indistinct, deeply sunk in the outer skin, and not encircled by rings; the mouth was furnished with a pair of large triangular lips or lobes; the branchial plumes lay on the right-hand side of the vent, which was placed in the middle of the hinder edge of the mantle; and the whole substance of the body was parenchymatous. They were extensile and exceedingly active. The figures given by Messrs. Adams and those in the 'British Mollusca' are not satisfactory. The discoverers of this singular little mollusk suspected that *Pelta* of Quatrefages may be the young before the branchial apparatus is developed. If that be the case, why was *Runcina* substituted for the older name?

Family V. PLEUROPHYLLIDI'IDÆ,

H. & A. Adams.

Body oblong, depressed, fleshy: *mantle* of a somewhat coriaceous texture, covering the upper part of the body and notched in front: *head* short, broad, and forming a triangular lobe in front of the mantle; it is mostly furnished with plaited lips and a pair of very strong horny jaws: *odontophore* broad; teeth numerous, arranged in cross rows: *tentacles* 2, very small, conical or club-shaped, close together, retractile, each in a socket within the pallial notch: *foot* elongated, somewhat narrower than the mantle, slightly indented in front and abruptly pointed behind: *gills* placed under the edges of the mantle on the hinder two-thirds of the body, and arranged in an oblique row of very numerous leaflets or laminæ on each side: *vent* lateral, posterior: *generative organs* on the same side, but near the front. Hermaphrodite.

Shell none, either external or internal.

For further particulars of this curious family see an admirable monograph by Dr. Bergh of Copenhagen, published in the 'Naturhistorisk Tidsskrift' for 1866 and 1867. Philippi placed it in the "Phyllidiens" of Lamarck, together with *Chiton, Patella,* and *Gadinia.* Forbes and Hanley called it *Phyllididæ,* Bergh *Pleurophyllididæ.*

Genus PLEUROPHYLLI'DIA*, Meckel. Pl. I. f. 4.

Mantle uninterrupted in front, and marked with longitudinal lines or warty: *tentacles* close together and contiguous, concealable within a distinct fleshy sheath.

Diphyllidia of Cuvier, but published one year subsequently to the above generic name, which has been adopted by Messrs. Adams, Woodward, and Bergh. De Blainville proposed another name, *Linguella*; and he supposed that *Armina* of Rafinesque was identical with *Diphyllidia.*

Pleurophyllidia Love'ni†, Bergh.

P. Loveni, Bergh in Foren. vidensk. Meddel. for 1860, p. 328. *Diphyllidia lineata,* F. & H. iv. (App.) p. 290, pl. KKK. f. 1–3.

Body slug-like, and rather slender, much narrower and pinched up towards the tail or extremity: *mantle* pale reddish-brown, interspersed with numerous minute black specks, and marked with about 30 raised white lines or stripes, which are irregularly nodulous and alternately larger; at the sides they are broken up into small tubercles and crowded: *tentacles* and *gills* yellowish: *foot* whitish, with the sole of a paler hue than the rest of the body. L. 1. B. 0·4.

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* From its leaf-like gills on the sides.

† Named after Professor Lovén, the eminent Swedish zoologist.

HABITAT: My friend the late Mr. Barlee dredged on the coast of Shetland a single specimen, which I exhibited at the Birmingham Meeting of the British Association in 1849. The Rev. R. C. Abbes procured another specimen from a fishing-boat at Whitburn, co. Durham. South-western coasts of Sweden (Lovén and Lilljeborg); Christianiafiord (Asbjörnsen); Hornbæk in Zealand (Hörring, *fide* Bergh); depths 7–40 f.

Diphyllidia undulata of Meckel (*D. lineata*, Otto), to which these specimens were at first considered to belong, is not uncommon in the Mediterranean. It differs from the present species in being of a larger size and proportionally very much broader, as well as in its colour, which varies from whitish to the darkest black; and the stripes in that species are more numerous, nearly regular, and equal in size. Bergh has also pointed out a distinction as regards the masticatory apparatus.

Order V. NUDIBRANCHIATA, Cuvier.

BODY slug-like, soft: *mantle* very large, covering the back and sides: *tentacles* consisting of one pair or two, which are placed on the front portion of the mantle: *eyes* sessile, imbedded in the skin behind the tentacles, at their base; they are conspicuous in the young, but not always discernible in the adult: *foot* extensile: *gills* or branchial processes, when present, always external, placed upon the back or sides, symmetrical, and arranged in plumes, tufts, or papillæ; in the

Dorididæ they form a circle on the central line, and in other families they are disposed in rows along the back or sides; in one section or suborder (Pellibranchiata) the entire surface or skin is the sole respiratory organ. Sexes united in each individual, which is strictly hermaphrodite, but with distinct organs of generation.

SHELL present only in the fry or embryonic state, and furnished with an operculum; it is rudimentary and resembles in shape a miniature *Nautilus* or *Helix*, having scarcely more than a single spire, which is reversed or sinistrorsal, as in the larval shell of *Aplysia*.

Until the present century all these mollusca were placed in two or three genera and consisted of about 20 species. Now the British Nudibranchs alone represent 12 families, 25 genera, and 111 species. Linné, Forskål, and Müller confined their observations to the external form. Bohadsch paved the way to a more complete investigation, which was systematically carried out by Cuvier in his admirable 'Mémoires.' During this century a succession of other zoologists, including Rapp, Ehrenberg, Risso, D'Orbigny, De Blainville, Milne-Edwards, Delle Chiaje, Couthouy, Leuckart, Quoy and Gaimard, Philippi, Cantraine, Verany, Sars, Lovén, Cavolini, Quatrefages, Nordmann, Alexander Stuart, especially Bergh, Meyer and Möbius, and, among our own countrymen, Montagu, Fleming, Forbes, Johnston, Allman, Reid, Leach, Dalyell, Collingwood, and M'Intosh, have greatly extended our knowledge of this peculiar group. But above all these must be ranked Mr. Joshua Alder and Mr. Albany Hancock, the authors of the most complete monograph that has yet appeared in the history of the Mollusca. It is one of the many valuable works of the Ray Society, and took ten years (1845–1855) in the publication. This monograph is so excellent, that I cannot do better than give their introductory remarks in a condensed form. I have very little to say in addition.

"The Nudibranchiate Mollusca are all marine, and, with the exception of a few species, are of small size. To some they are known by the familiar name of sea-slugs—a name, however, not exclusively applied to them, as it is given to several other naked mollusks, which, like them, have a resemblance to the land-slugs in the general form of their body. The term, as applied to these animals, is far from complimentary. The land-slugs are generally sombre in colour, and plain and uninviting in form, while these little inhabitants of the deep are often adorned with the most brilliant colours, and of forms the most varied and graceful. Their body is usually elongated, soft, and attached through its whole length to the foot or disk upon which they crawl. It is not unfrequently covered with a cloak; and in the family *Dorididæ* the skin is strengthened with calcareous spicula. The head is anterior, and frequently indistinct, bearing one or two pairs of tentacles, the upper pair of which are placed on the cloak when it is present; and behind them the eyes are situated. But the characteristic peculiarity of these mollusks is the appendages that constitute the breathing-organs." These last I have described in the systematic characters of the order.

Omitting anatomical details, I will continue the account of their life-history.

"The spawn of the Nudibranchiate Mollusca is deposited in the shape of a gelatinous band, always arranged in a more or less spiral form, and fastened to corallines and the underside of stones by one of its edges. The ova are minute and very numerous, amounting in some species to several thousands. Before the period of exclusion, the young may be seen revolving on their own axis by means of vibratile cilia; and on escaping from the egg, they swim about freely in the water by the same means. The larva is extremely minute, and has more the appearance of a rotiferous animalcule than a mollusk. It is enclosed in a transparent, calcareous, nautiloid shell, with an operculum. Its structure is very simple, showing no signs of the external organs that distinguish the future adult. The principal portion visible outside the shell is composed of two flat disks or lobes, fringed with long cilia, by the motion of which it swims freely through the water. These are often withdrawn into the shell; and the operculum is closed upon them when the animal is at rest. We have not been able to trace the animal further than the first stage of its development, and are therefore unable to say by what process it assumes the very different form of the adult state. We have succeeded in bringing out the larvæ of *Doris, Tritonia, Melibœa,* and *Eolis,* between all of which there is a very great resemblance." Nordmann gave, in the 'Annales des Sciences Naturelles' for 1846, some particulars of their development, and showed how the metamorphosis is effected.

In their adult state the senses are very imperfect. For instance we are told that "the sole object of vision appears to be that of ascertaining the presence of light, and thus directing the animal in its search for shelter in dark and concealed places." The dorsal tentacles are the organs of smell; but "olfaction in these animals probably is not so much to assist in the discovery of alimentary matters, as to give warning of the unhealthy state of the surrounding medium, arising from putrescence or other causes." The skin of the *Doris* family is always stiffened by imbedded calcareous spicula of various forms; and its outer surface, in all the Nudibranchs, is provided with vibratile cilia. Their habits are very interesting. Some kinds are nocturnal; others may be observed in a state of activity during the daytime, in tide-pools left among the rocks and in shallow water, apparently enjoying the warm rays of the sun; the greater number avoid the light, concealing themselves under stones and shelving rocks. They range from a little below high-water mark to nearly one hundred fathoms on our northern coasts. They are usually sluggish in their movements, some remaining for hours fixed to a spot; a few, however, are very active and lively. Crawling is the ordinary mode of progression. "This is effected, in the manner of the snail, by a series of minute undulations of the under surface of the foot, arising from the alternate relaxation and contraction of the pedal muscles." They also float slowly along the surface of the water, in an inverted position, probably by an action similar to that of crawling, aided by the slime which continually exudes from the body, and on which it appears to creep. While thus floating, "the Nudibranchs occasionally drop suddenly down, suspending themselves from the surface by a thread of mucus, which is fixed to the tail or posterior extremity of the foot. In this way they will let themselves gradually down to the bottom, or remain some time pendent in the water without apparent support; for the thread of mucus is so transparent that it can scarcely be seen." It is said that some kinds (e. g. *Tethys*) swim freely through the water in any direction; these have a large head-veil and crested tail, which serve as fins. The Rev. R. T. Lowe, in his graphic description of the genus *Peplidia,* found on the shores of Madeira, says (Ann. & Mag.

N. H. ii. p. 311), "At night, especially when thus in motion, it appeared most brilliantly phosphorescent; the light flashing progressively but very rapidly along the body, especially from all the branchial tufts and the edges of the veil and crest." The Nudibranchs are very sensitive to external influences, shrinking quickly from contact, and withdrawing their organs on the slightest apprehension of danger. When crawling on seaweeds or corallines, they often detach themselves on being disturbed, and drop to the bottom of the water. The *Eolides,* when alarmed or irritated, erect their papillæ, and sometimes agitate them in a convulsive manner, directing the points to any source of annoyance, each papilla being endowed with a motion independently of the rest. On such occasions urticating filaments are probably ejected from the tips of these organs. Alder and Hancock once observed minute streams of a milk-white fluid (which they believed to be of a stinging nature) emitted from the papillæ of *Eolis picta.* The papillæ of *Eolis* and several allied genera are very slightly attached to the back; and the animal seems to have the power of casting them off voluntarily, in the same way that a crab throws off its claws or a starfish its arms. The papillæ, when cast off, swim through the water, like worms, propelled by the vibratile cilia, and occasionally by a spasmodic action of the muscles. They are quickly reproduced, if the animal is in a healthy state; and in the meantime it does not appear to suffer any inconvenience from the want of these organs, crawling about in perfect unconcern. For this reason Mr. Couthouy conjectured that the so-called branchial processes are not true respiratory organs, but that this function was chiefly performed by the skin in all the Nudibranchs. The separation of *Eolis* and a few other genera as a distinct group, under the name of "Phlébentérés," proposed by Prof. Quatrefages, was based on similar grounds, and gave rise to a noted and warm discussion. When kept in confinement, Nudibranchs enjoy a considerable tenacity of life, although any impurity of the water or an extreme change of temperature affects them very sensibly. This should be borne in mind by all amateur naturalists who wish to preserve these pretty creatures in an aquarium. The littoral species can support a greater variation of temperature than those from deep water; indeed the former will live for a considerable time out of water in a moist saline atmosphere. Their power of enduring abstinence is remarkable. "We have kept them for weeks, and even months, without food, and have observed but little diminution of their vital energy." They are, however, very voracious, and are animal-eaters; their food consists of other mollusks, sea-anemones, zoophytes, and sponges, the *Eolides* sometimes devouring weaker individuals of their own kind. Nearly all possess an odontophore or "tongue" armed with recurved spines. In some species the whole of the lingual processes do not amount to 112; in *Tritonia Hombergi* there are upwards of 36,000. *Tethys* has neither jaws nor a tongue. This apparatus is rather a prehensile than rasping instrument. "In *Eolis* the protruded jaws lay hold of its prey, cutting out lump after lump, which the tongue, advancing, seizes by the aid of its recurved spines, and with a backward motion carries to the entrance of the œsophagus." It is supposed that most of them are very short-lived, which may account for the periodical appearance of certain species within tide-marks in particular places, and for their usually disappearing soon after the breeding-season. Mr.

Peach informs me that many species come inshore at Wick every spring, for the purpose of spawning. Their fecundity is very great. One of their functions is thus fulfilled by these and

> "all kind of natures,
> That labour on the bosom of this sphere,
> To propagate their states."

In a day or two after copulation the spawn is deposited. This is enveloped in a perfectly transparent mucus, which at first is tenacious and adheres to whatever it comes in contact with. While shedding the spawn the animal slowly and gradually moves backward in a spiral direction, beginning in the centre; thus the spawn assumes the form of a coil. The fry generally emerges from its gelatinous covering in about ten days or a fortnight after the spawn has been deposited. "That a minute creature, scarcely visible to the naked eye, enclosed in an operculated shell, and swimming freely through the water by means of ciliated lobes, should turn into the large and sluggish *Doris tuberculata* or *Tritonia Hombergii*, is one of nature's romances, only to be learnt by a careful study of her works." The Nudibranchs are frequently infested with parasitic Entomostraca; these are most commonly buried beneath the skin, but in some cases inhabit the abdominal cavity, or adhere to the branchial processes and other parts of the surface of the body. The mollusks of the present order are widely distributed, from the arctic ocean to the tropics; a few are oceanic wanderers, and crawl on the stalks and leaves of floating seaweeds. "They require to be watched and drawn whilst living and active, since after immersion in spirits they lose both their form and colour" (Woodward). With respect to the urticating filaments of the *Eolides*, Huxley, Gosse, and Strethill Wright supposed that they are adventitious, being fæcal and derived from the hydroid polyps and *Actiniæ* on which the *Eolides* subsist. Alder and Bergh, on the contrary, believed that the filaments are really the product of the *Eolides*, and used by them as weapons of defence. In some genera of this family they are altogether wanting. According to Dr. Baur, that abnormal and puzzling mollusk *Entoconcha mirabilis* of the late J. Müller (which is an internal parasite of *Synapta digitata*) is a Nudibranch. Although most of this Order are zoophagous, *Limapontia* and others of a simpler kind feed on seaweeds, and are preyed on by Crustacea and small fishes. It seems as if one of the principal uses of all animals were to eat or to be eaten. Let us apply this idea to our own case. What a gloomy prospect would lie before us, if there were no hereafter, and we could only say of our physical destiny,

> Every organic thing we see, that springs
> To sentient life, by the Creator's will,
> Its individual office to fulfil,
> To us a sad and warning message brings.
> 'Twixt fear and hope, in war or doubtful peace,
> Each for its own existence ever strives:
> Until at last the fatal hour arrives,
> When fear and hope, and life itself, shall cease.

The leading genera have been well characterized by Dr. Johnston in the following terms:—"The *Doris* has its branchiæ, sometimes feathered like an ostrich-plume, placed near the posterior extremity; and the creature has the power of concealing them when in danger. The *Tritonia* is more slug-like than the *Doris*; but its branchiæ form a curled fringe, interrupted at intervals, along each side of the back. The *Tethys* has, besides, a largely expanded veil over the mantle, imparting a very peculiar character to the genus. In the *Glaucus* the branchiæ are moulded into fingered fan-like fins; while in *Eolis* and *Tergipes* they form conical or cylindrical papillæ, disposed in series along the back and sides." *Dendronotus* must surely have been one of the

> "things that are forked and horned and soft,"

which Tennyson's mermaid expected would wait upon her minstrelsy.

The following descriptive catalogue of the British Nudibranchiate Mollusca was most kindly prepared for me by my lamented friend Mr. Alder; and it was, I believe, his last scientific work. Being nearly twelve years later than the Monograph, this catalogue is of course more perfect. I have made only a few alterations and additions, the latter being within brackets. In adopting the merger or inclusion of Pellibranchiata as a suborder, I may remark that it is questionable whether, in a physiological point of view, the Nudibranchs ought not to be united with the Pulmonobranchs. The divisions founded on the respiratory system are, like many other methods of classification, incomplete and unsatisfactory. An illustration of each family will be given in the plates of genera for this volume. Some of them are taken from the recent work of Meyer and Möbius ('Fauna der Kieler Bucht'), which ought to be consulted by all who study this group.

Suborder I. PELLIBRANCHIATA.

Without special gills: skin without spicula.

This group was first described as a distinct order by Alder and Hancock in the 'Annals of Natural History' for June 1848; it is now proposed to consider it a suborder of *Nudibranchiata*. It forms, however, an aberrant member of that order, the animals being of very simple structure, and possessing none of the variety and beauty of form, and little of the brilliancy of colouring, that are usually found in the Nudibranchs. M. de Quatrefages united these animals with the *Eolodidæ* in his order of *Phlebenterata*; but the relationship between them is not so close, nor the organization of either group so low, as was supposed to be the case by that distinguished naturalist.

Family I. LIMAPONTIIDÆ, Alder and Hancock.

Without mantle or appendages: *tentacles* 2 or wanting: *vent* posterior: *odontophore* denticulated; no jaws.

Genus I. LIMAPONTIA*, Johnston.

[Pl. I. f. 5.]

Body limaciform, simple, without tentacles: *vent* dorsal and posterior: *odontophore* narrow, with a single row of spines.

Chalidis of Quatrefages is probably synonymous with this genus. [*Pontolimax*, Creplin.]

1. Limapontia nigra, Johnston.

L. nigra, Johnst. in Loudon's Mag. N. H. ix. p. 79; A. & H. in Ann. N. H. 2nd ser. i. p. 402, pl. 19. f. 4–8.

Body smooth, rather depressed, nearly linear when extended, but very contractile; the sides slightly overhanging the foot: *head* truncated in front and flat at the sides, except where it is elevated into two crest-like ridges, arched from behind forwards; on the sides of which posteriorly the eyes are placed in a pale circular space, which is prolonged into the crest: *vent* subposterior. The general colour is black, but sometimes individuals are found transparent and nearly colourless, showing the greenish biliary organ through the skin. L. 0·14.

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* From *limax*, a slug, and *pontus*, the sea.

Habitat: On Confervæ [and small seaweeds] in rock-pools [and among *Zostera marina*] between tide-marks; Berwick Bay (Johnston); Cullercoats (A. Hancock); Whitburn, Durham (Howse); Torbay (Alder); Falmouth (Cocks). [Shetland (J. G. J.); Scandinavian coasts (Müller and others); Heligoland (Frey and Leuckart); Brittany (Taslé).]

This curious little animal is probably pretty generally diffused, but on account of its minute size it may readily be overlooked. It is gregarious; and, wherever met with, it has usually been found in abundance, appearing when contracted like little black dots scattered over the Conferva on which it feeds. When bruised it has a peculiar sweetish smell, which seems to be derived from the seaweed. [It swims in a reversed position, and when disturbed rolls itself into a ball; sometimes, while floating, it turns itself round in a short coil. This tiny sea-slug has a quaint and "auld warld" aspect.]

[*Fasciola capitata*, Müll. Verm. Helm. p. 79: this specific name ought to be used. Also *Planaria limacina*, Fabricius.]

2. L. depressa, Alder and Hancock.

L. depressa, A. & H. in Ann. N. H. 3rd ser. x. p. 264; Hancock in Tynes. Club Trans. v. p. 315, pl. 17.

Body oblong-ovate, depressed, swelling behind the centre and terminating in a blunt point posteriorly; black, generally with minute yellowish-white spots or freckles: *head* rounded in front and slightly angulated at the sides; the lateral crests less elevated than in *L. nigra*, with the eyes situated in a white oblong area at the side of each: *vent* placed in a depression at the posterior extremity of the body. L. 0·4.

Habitat: On a Conferva (*Vaucheria submarina*?) in brackish water, Hylton Dene, near Sunderland (A. Hancock); Loughor Marsh, near Swansea (Bate, Jeffreys, and Moggridge).

This species is distinguished from the last by its much greater size, more depressed form, and wider lateral expansion, as well as by the more backward position of the vent. The *Limapontia* figured by Mr. Spence Bate in his 'Notes on the Fauna of Swansea and the Neighbourhood' (1849) evidently belongs to this species, not only from its size and form, but also from the more branched character of the hepatic organ, as shown in figures 5 and 6.

Genus II. ACTEO'NIA*, Quatrefages.

Body limaciform, with a slight ridge on each side of the back: *head* subangulated: *tentacles* 2, more or less developed, rising from a carina on each side of the head: *vent* dorsal, situated two-thirds down the back: *odontophore* having a single row of spines.

1. Acteonia corruga'ta, Alder and Hancock.

A. corrugata, A. & H. in Ann. N. H. 2nd ser. i. p. 403, pl. 19. f. 2, 3.

Body nearly linear, rather short and stout, regularly wrinkled in a longitudinal direction; black, excepting the carina and tail, which are whitish: *head* carinated at the sides, each carina being produced into a short, flat, whitish, tentacular process: *eyes* placed in circular white spots behind the carinæ: there is a slightly raised ridge on each side of the back in the region of the vent. L. 0·12.

Habitat: Rare; found by Mr. Cocks at Falmouth feeding upon *Conferva glaucescens* in company with *Limapontia nigra*.

2. A. Cocksii, Alder and Hancock.

Cenia Cocksii, A. & H. in Ann. N. H. 2nd ser. i. p. 404, pl. 19. f. 1.

Body robust, smooth, considerably elevated on the back; black above, fading into fawn colour at the sides: *head* slightly angulated, with a central black stripe, the sides of which, as well as the tentacles and the area round the eyes, are yellow or fawncoloured: *tentacles* of moderate length, linear and cylindrical; on each side of the back near the vent is a slight ridge with three or four pale tubercular spots. L. 0·2.

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* From *Actæon*, a synonym of *Elysia*.

HABITAT: In rock-pools between tide-marks, on *Chorda tomentaria* and *Dumontia filiformis,* Falmouth (Cocks). [Burghead, Moray Firth (Gordon).]

Family II. ELYSI'IDÆ, (*Elysiadæ*) Alder and Hancock.

Without cloak or gills: sides of the body produced into foliaceous lobes: *tentacles* 2 or 4, generally folded longitudinally: *vent* dorsal or latero-dorsal: *odontophore* denticulated; no jaws.

Though the mollusks of this family have no specialized gills, the expanded lobes of the body, on the internal surface of which the blood-vessels are ramified, make a nearer approach to specialization than in other members of the group. Several handsome species of the family are found in the seas of warm climates; with us it is represented by a single species only.

Genus ELY'SIA*, Risso.

[Pl. I. f. 6.]

BODY limaciform, with the sides expanded into lobes folding over the back: *tentacles* 2, longitudinally folded: *gastro-hepatic system* much branched: *vent* latero-dorsal, in front of the heart: *odontophore* having a single row of spines.

This genus is the *Actæon* of Oken but not of De Montfort; *Aplysiopterus* of Delle Chiaje is also a synonym.

ELYSIA VI'RIDIS, Montagu.

Laplysia viridis, Mont. in Linn. Trans. vii. p. 76, pl. 7. f. 1. *E. viridis,* F. & H. iii. p. 614, pl. CCC. f. 3.

BODY ovate-oblong, depressed, grass-green, with bright azure or bluish-green spots of a metallic lustre: *tentacles* ear-shaped, obtuse, dark green, frequently reflecting a purplish hue; the darker colour is frequently continued over the head and on the upper and outer side of the lateral lobes of the body, which are margined with white; a whitish space surrounds each eye, and the elevated region of the heart is also pale: the lateral expansions rise up in a curved line towards the middle of the back, and diminish gradually to the tail; their inside is paler than the out, and beautifully veined with green from the hepatic vessels appearing through. L. 0·75.

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* [Possibly from ἑλύω, to fold inwards.]

[Var. *olivacea.* Dark greenish- or purplish-brown, spotted with blue and red dots, the edges of the mantle and tips of the tentacles being white.]

Habitat: On *Codium tomentosum, Zostera marina,* and other green seaweeds, in tide-pools, or occasionally in shallow water, especially on the south and west coasts. [The variety inhabits Lochmaddy (M'Intosh) and Kiel Bay (Meyer and Möbius). It does not appear to have been met with yet on the east coast of England, though it has a wide range in European seas, extending from Norway to the Mediterranean. [Syn. *Actæon minutum,* Sars.]

Suborder II. POLYBRANCHIATA.

Gills, or, rather, branchial processes, arranged along the sides of the body; skin without spicula.

Family I. HERMÆ'IDÆ, Alder and Hancock.

Without mantle: *branchial processes* linear or papillose: *tentacles* 2, dorsal: *vent* dorsal: no jaws: hepatic system with two longitudinal dorsal vessels.

Genus I. ALDE'RIA*, Allman.

Body ovate: *tentacles* rudimentary or none: *branchial processes* papillose, set in transverse rows on the sides of the back: *vent* postero-dorsal, nipple-shaped: *odontophore* with a single series of plates bearing a large central spine.

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* [Named in compliment to the author of this Synopsis.]

Alderia modesta, Lovén.

A. modesta, Allm. in Ann. N. H. 1st ser. xvii. p. 4; A. & H. Brit. Nud. Moll. fam. 3, pl. 41. f. 1–5.

Body ovate-oblong, subconvex, yellowish or greenish, generally more or less variegated and spotted with brownish grey: *head* small, slightly notched in front, and produced at the sides into obtuse lobes: *branchial processes* elliptic-oblong, obtuse, coloured like the body, and arranged in 6 or 7 diagonal rows on the sides of the back, increasing in size posteriorly: *foot* large and broad, rounded in front and reflected upwards at the sides. L. 0·5.

Habitat: Gregarious on Confervæ in shallow brackish water, in a salt-marsh at Skibbereen, county Cork (Allman); Loughor Marsh, near Swansea (Bate, Jeffreys, and Moggridge); in a salt-marsh at Hylton Dene, Durham (G. S. Brady). [Escaut, below Antwerp (Nyst, as *A. scaldiana*).]

This curious animal is almost amphibious, being only found in very shallow brackish water in marshes, barely within the reach of the tide, and occasionally crawling on the moist weed beyond. It is a rare [or local] species, but generally plentiful where it does occur. It was first met with in Sweden by Professor Lovén, who published it under the name of *Stiliger modestus* in the Transactions of the Royal Swedish Academy: but he afterwards adopted the generic appellation here given in his 'Index Molluscorum Scandinaviæ.'

Genus II. HERMÆA*, Lovén.

[Pl. II. f. 1.]

Body elongated, tapering posteriorly: *tentacles* 2, ear-shaped or longitudinally folded: *branchial processes* linear-oblong, tapering, placed along the sides of the back: *vent* antero-dorsal: *odontophore* with a single series of plates bearing a broad spine.

1. Hermæa bi′fida, Montagu.

Doris bifida, Mont. in Linn. Trans. xi. p. 198, pl. 14. f. 3. *H. bifida*, A. & H. Brit. Nud. Moll. fam. 3, pl. 39.

Body linear, very slender, tapering to a fine point behind.

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* [Mercurial or agile.]

pellucid white, with 2 red lines along the back: *head* small: *tentacles* rather short, longitudinally folded, truncated, rising into a point behind: *branchial processes* elliptic-oblong, pointed, slightly tuberculated, with a ramified rosecoloured gland in the centre of each, giving them a leaf-like appearance; they are arranged in numerous transverse rows of two or three abreast on each side of the back. L. 0·9.

Habitat: Among small seaweeds within tide-marks or in shallow water; rare. Devonshire coast (Montagu); Belfast Bay (Getty and Hyndman); Black Rock, Leith (Landsborough). [Shetland (J. G. J.).]

This elegant little Nudibranch has been very seldom met with on our coast; but the localities in which it occurs show it to be pretty widely dispersed. Its range extends to Sweden.

2. H. dendri'tica, Alder and Hancock.

Calliopæa dendritica, A. & H. in Ann. N. H. 1st ser. xii. p. 233. *H. dendritica*, Brit. Nud. Moll. fam. 3, pl. 40.

Body ovate, rather bulging out in the centre, and tapering to a fine point behind; greenish-white, with dendritic green or olive veinings: *tentacles* oblong ear-shaped, with a rounded apex, their margin forming a continuous outline with the sides of the head: *branchial processes* elliptic-linear, with an internal ramified greenish gland, and spotted with white externally; they are set in 8 transverse rows of 3 or 4 each on the sides of the back. L. 0·35.

Habitat: On green seaweeds, especially *Codium tomentosum*, in rock-pools or in shallow water; gregarious. Torbay (Mrs. Wyatt); Whitley, Northumberland, rare (Miss Dickinson). [W. Sweden (Lovén).]

Family II. FIONIDÆ, Alder and Hancock.

Mantle rudimentary: *branchial processes* linear or papillose: *tentacles* 4, simple: *vent* latero-dorsal: *mouth* with large corneous jaws: hepatic system with two longitudinal vessels.

This family differs from the *Eolididæ* in the presence of a subpallial margin or rudimentary mantle, in having two gastro-hepatic vessels running down the back, and in the dorsal position of the vent. In the last two characters it approaches more nearly to the *Hermæidæ*.

Genus FIO'NA*, Alder and Hancock.
[Pl. II. f. 2.]

Body elliptic-oblong: *tentacles* 4, subdorsal: *branchial processes* conical, with a membranous expansion on one side, and set on a subpallial margin: *odontophore* with a single series of arched plates bearing a stout central spine and lateral denticles.

Fiona no'bilis, Alder and Hancock.

Oithona nobilis, A. & H. in Ann. N. H. 2nd ser. viii. p. 291, pl. 9, 10.
F. nobilis, Brit. Nud. Moll. fam. 3, pl. 38 *a*.

Body stout, limaciform, of a pale buffcolour: *tentacles* linear, smooth, broad at the base and tapering to a point above; the anterior pair placed considerably behind the margin of the head: *branchial processes* numerous, linear-conical, rather compressed, with the inner margin expanded into a membranous frill; the central gland is of a rich brown, the external surface buffcoloured, the apices opaque bluish-white, with a brilliant metallic lustre, which is observable also on the back: the branchial processes or papillæ are crowded without apparent order on the sides of the back and pallial ridge, which is considerably produced behind. L. 2.

Habitat: Two specimens of this splendid mollusk were found by Mr. Cocks under a stone at Bar Point, Falmouth, during a low spring-tide in 1849. It has not since been met with. [Finistére (Fischer).]

Family III. EOLI'DIDÆ, D'Orbigny.

Branchial processes linear or fusiform, set along the sides of the back; without mantle: *tentacles* 4 or 2, non-retractile: *vent* lateral: gastro-hepatic system with a posterior central vessel.

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* A proper name from Ossian.

Genus I. EMBLETO'NIA*, Alder and Hancock.

Body slender: *tentacles* 2, dorsal, linear; the place of the oval pair occupied by 2 flattened lateral lobes: *branchial processes* fusiform or clavate, set usually in single series on each side of the back, occasionally in double [or triple] series or clusters: *odontophore* linear, with a single series of plates, each bearing a central spine and lateral denticles; jaws corneous.

1. Embletonia pulchra, Alder and Hancock.

Pterochilus pulcher, A. & H. in Ann. N. H. 1st ser. xiv. p. 329. *E. pulchra*, Brit. Nud. Moll. fam. 3, pl. 38.

Body fleshcoloured, spotted with white: *tentacles* short, set wide apart: *head-lobes* rounded: *branchial processes* stout, elliptical, orange-red spotted with white, 5 or 6 in single series on each side: dorsal vessel red, undulating, appearing through the skin. L. 0·2.

Habitat: Within tide-marks at Rothesay, Isle of Bute (Alder); Ardrossan, Ayrshire (Rev. D. Landsborough, jun.).

2. E. minuta, Forbes and Goodsir.

Eolidia minuta, Forb. & Goods. in Rep. Brit. Assoc. 1839. *Embletonia minuta*, F. & H. iii. p. 607, pl. BBB. f. 5.

Body pinkish-yellow, linear: *tentacles* rather longer than the last, wrinkled: *head-lobes* produced: *branchial processes* nearly linear, pinkish, tipped with white, 7 in single series on each side of the back. L. 0·12.

Habitat: Dredged in 7 fathoms among *Laminariæ* at Lerwick (Forbes).

3. E. pallida, Alder and Hancock.

E. pallida, A. & H. Brit. Nud. Moll. p. 52, and Appendix, p. xii.

Body yellowish-white with a few black spots on the back: *tentacles* approximating: *head-lobes* indistinct, forming a semicircular veil which is a little produced at the sides: *branchial processes* nearly linear, very pale orange, set in a double longitudinal row of 4 or 5 each on each side of the back. L. 0·1.

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* Named in compliment to Dr. Embleton, of Newcastle.

Habitat: Among seaweeds on the shore at Birkenhead (Price); Mouth of the Dee (Collingwood). [W. Sweden (Lovén); Kiel Bay (Meyer and Möbius).]

[Mr. W. S. Kent has lately described, in the 'Proceedings of the Zoological Society,' a new species (*E. Grayi*), allied to *E. pallida*, from the Victoria Docks, which has a triple row of branchial processes on each side of the back, and in which the head-lobes are highly developed.]

Genus II. E'OLIS*, Cuvier.

[Pl. II. f. 3.]

Body limaciform, more or less elongated and tapering behind, without mantle: *tentacles* 4 (2 dorsal and 2 oral), linear, non-retractile: *branchial processes* papillose, linear or fusiform, arranged in transverse rows, sometimes clustered, on the sides of the back: *foot* with the anterior angle often much produced: *odontophore* narrow, consisting generally of a single row of spinous plates; with large corneous jaws.

A. *Body broad: branchial processes or papillæ in numerous transverse rows: lingual plates pectinated.* (Eolis *proper*.)

1. Eolis papillosa, Linné.

Limax papillosus, Linn. S. N. p. 1082. *E. papillosa*, A. & H. Brit. Nud. Moll. fam. 3, pl. 9.

Body rather broadly ovate, somewhat depressed; brown, grey, or orange, spotted with brown or purple and white: *dorsal tentacles* shortish, subconical, brown, with white tips: *head* broad, with generally a triangular mark of opaque white, extending into the *oral tentacles*, which are longer than the dorsal pair: *branchial processes* stout, conical, and rather flattened, strongly freckled with brown or lilac and white, with white tips; set in 18–24 close transverse rows: *foot* having its anterior angles short and pointed. L. 1·5–3.

Habitat: Under stones between tide-marks, on most parts of our coasts; not uncommon.

This is the largest of the British species, and is pretty generally diffused in the seas of northern Europe. On account of its variation in colour and markings, several species have been made out of it. *E. Zetlandica* of Forbes, *E. Lesliana* and *E. Murrayana* of Macgillivray, *E. rosea* and *E. obtusalis* of Alder and Hancock, are all now considered to be varieties of *E. papillosa*. Its spawn may be seen on the underside of stones in the spring and summer months, consisting of a gelatinous pinkish-white cord, much convoluted, and having a beautiful festooned appearance when viewed under water. [Mr. Peach found at Wick a unicorn monstrosity; it had only a single dorsal tentacle and sheath placed in the middle.]

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* A mythological name [properly *Æolis*].

2. E. GLAUCA, Alder and Hancock.

E. glauca, A. & H. in Ann. N. H. 1st ser. xvi. p. 314; Brit. Nud. Moll. fam. 3, pl. 11.

BODY elongated, rather depressed, brick-red: *dorsal tentacles* moderately long, red, tipped with white: *oral tentacles* slightly longer than the dorsal, white, with a line of red: *branchial processes* conical, vermicular, subdepressed, and tapering a good deal towards the tip, glaucous or olivaceous, freckled with brown and white, set in about 14 rows: *foot* with the anterior angles a little produced. L. 1·75.

HABITAT: Dredged in deepish water in Torbay, and in Menai Straits near Beaumaris (Alder); Falmouth (Cocks).

E. glauca is readily distinguished from *E. papillosa* by its more slender form and the vermicular character of the branchial processes. The plates of the tongue of this species form a double arch, those of *E. papillosa* only a single arch.

3. E. ALDE'RI, Cocks.

E. Alderi, Cocks in the 'Naturalist,' ii. p. 1, pl. 1. f. 1.; A. & H. Brit. Nud. Moll. fam. 3, pl. 10. f. 5, 6.

BODY elongated, white or greyish: *dorsal tentacles* moderately long, bright yellow: *oral tentacles* slightly longer than the dorsal pair, white, tipped with yellow: *branchial processes* slightly conical, set in 12 to 14 dense rows nearly covering the back; the first two or three rows opaque white, the remainder greyish with a pale brownish freckling, and yellow or orange near the tip: *foot* with the anterior angles a little produced. L. 0·7.

Habitat: In tide-pools at Gwyllyn Vase, Falmouth (Cocks).

Mr. Cocks met with this species in considerable numbers in the summer of 1848; it was scarce in 1849, and we have no record of its having since been found. *E. Alderi* bears some resemblance to the last, but differs in size and colour. The lingual plates have a similar character.

B. *Branchial processes clustered: dorsal tentacles laminated; angles of the foot produced: odontophore with a central spine and lateral denticulations.* (Facelina, *A. & H.*)

4. E. coronа'ta, Forbes.

E. coronata, Forb. in 'Athenæum' for 1839, No. 618, p. 647; A. & H. Brit. Nud. Moll. fam. 3, pl. 12.

Body slender, white tinged with fleshcolour: *dorsal tentacles* yellowish, strongly annulated (with 7 or 8 rings): *oral tentacles* long and tapering: *branchial processes* rather long, nearly linear, crimson, with a metallic lustre of blue on the upper surface, and an opaque-white ring near the apex; set in 6 or 7 clusters on each side of the back: *foot* having its anterior angles produced. L. 1.

Habitat: On most parts of the British coast within tidemarks and in the Laminarian zone; not uncommon.

This is one of the most beautiful species of a beautiful genus ["the tiger of its tribe," Gordon]. The *Doris longicornis* of Montagu and *Eolida plumosa* of Fleming are probably varieties of it. It does not appear to have been recognized out of Britain. [W. Sweden (Lovén); North of France (Bouchard-Chantereaux and Fischer); Rochelle (Aucapitaine).]

5. E. Drummondi, Thompson.

E. Drummondi, Thomps. in Rep. Brit. Assoc. for 1843, p. 250; A. & H. Brit. Nud. Moll. fam. 3, pl. 13.

Body rather broad, especially towards the head, tapering abruptly behind, fleshcoloured: *dorsal tentacles* longish, fawn-coloured; densely laminated (with 20 to 30 rings): *oral ten-*

tacles very long, stout and tapering: *branchial processes* long, nearly linear, dull red or brownish, sometimes inclined to olive, with white tips, set in 4 to 6 clusters on each side of the back: *foot* with the anterior angles much produced. L. 1·5.

HABITAT: Near low-water mark and in shallow water; abundant on some parts of the west coast of England and Scotland, as also in Ireland, but more rare on the south and east. [Kiel Bay, and Samsoe in Jutland (Meyer and Möbius); Arcachon (Fischer).]

This species is shorter and stouter than the last, with the head rather larger. The colour of the branchial papillæ is very variable, but generally partakes more or less of a reddish hue.

6. E. PUNCTATA, Alder and Hancock.

E. punctata, A. & H. in Ann. N. H. 1st ser. xvi. p. 315; Brit. Nud. Moll. fam. 3, pl. 15.

BODY yellowish-fleshcoloured, covered with opaque white spots: *dorsal tentacles* yellowish, very obliquely laminated: *oral tentacles* long, white: *branchial processes* oblong, tapering to a rather acute point, reddish-brown, spotted with white: set in 5 or 6 clusters on each side of the back: *foot* with the anterior angles much produced. L. 1.

HABITAT: Dredged in deepish water off Berry Head, Torbay (Alder).

7. E. ELEGANS, Alder and Hancock.

E. elegans, A. & H. in Ann. N. H. 1st ser. xvi. p. 315; Brit. Nud. Moll. fam. 3, pl. 17. f. 2, 3, 4.

BODY rather slender, yellowish-white: *dorsal tentacles* stoutish, buff or fawncoloured, with white tips: strongly wrinkled transversely: *oral tentacles* nearly twice the length of the dorsal pair, white: *branchial processes* rosy-fleshcoloured, deepening into blackish-purple at the top and bottom, with a ring of opaque white at the apex: set in about 7 clusters on each side: *foot* having its anterior angles very much produced. L. 0·5.

HABITAT: Dredged in about 15 fathoms off Berry Head (Alder).

C. *Branchial processes clustered: dorsal tentacles smooth: angles of the foot produced: odontophore as in the last section, with the addition of 2 separate lateral spines.* (Coryphella, *Gray*.)

8. E. RUFIBRANCHIALIS, Johnston.

E. rufibranchialis, Johnst. in Loud. Mag. N. H. v. p. 428; A. & H. Brit. Nud. Moll. fam. 3, pl. 14.

BODY very slender, tapering to an elongated and finely pointed tail, white: *dorsal tentacles* linear, of moderate length, slightly corrugated: *oral tentacles* a very little shorter than the dorsal pair: *branchial processes* linear, rosecoloured, with white tips; set in 6 or 7 clusters on each side of the back: *foot* with the anterior angles rather short. L. 1.

HABITAT: Near low-water mark, on most parts of our coast, but more especially in the east; not rare. It is difficult to give exact localities, as other species have occasionally been taken for it. [Kiel Bay and Little Belt (Meyer and Möbius).]

9. E. LINEA'TA, Lovén.

E. lineata, Lov. Ind. Moll. Scand. p. 8; A. & H. Brit. Nud. Moll. fam. 3, pl. 16.

BODY rather slender, pellucid white, with 3 longitudinal opaque-white lines on the body, the central one bifurcating on the head into the oral tentacles: *dorsal tentacles* longish, with an opaque-white line down the back of each: *oral tentacles* rather longer than the dorsal: *branchial processes* nearly linear, rosecoloured, with an opaque-white line in front and white rings at the tip; set in 4 or 5 clusters on the sides of the back: *foot* with the anterior angles produced. L. 1.

HABITAT: Between tide-marks and in shallow water. Saltcoats, Ayrshire (Landsborough): Douglas, Isle of Man (Alder); Morecambe, Lancashire (Moser). It was found on the Swedish coast by Professor Lovén. [Nice (Verany, as *Æolis Demartinii*).]

10. E. GRA'CILIS, Alder and Hancock.

E. gracilis, A. & H. in Ann. N. H. xiii. p. 166; Brit. Nud. Moll. fam. 3, pl. 18.

BODY slender, white: *dorsal tentacles* long, linear, white: *oral tentacles* slightly longer than the dorsal pair: *head* rather long: *branchial processes* elliptic-oblong, orange, with a narrow ring of opaque white at the apex: *foot* with the anterior angles produced and arched. L. 0·5.

HABITAT: Within tide-marks; rather rare. Whitley, Cullercoats, and Newbiggin, Northumberland (A. & H.); Menai Straits (Alder). [Cumbrae, N.B. (Robertson).]

11. E. SMARAG'DINA, Alder and Hancock.

E. smaragdina, A. & H. Brit. Nud. Moll. fam. 3, pl. 17.

BODY slender, white: *dorsal* and *oral tentacles* long, of nearly equal length, white: *head* short: *branchial processes* elliptic-oblong, green, with white tips; set in 5 clusters: *foot* with the anterior angles produced. L. 0·5.

HABITAT: Among seaweeds; very rare. Whitley, Northumberland (Hancock); Burghead (Murray). [W. Sweden (Lovén).]

This species bears great resemblance to the last, from which it differs principally in the colour of the branchial processes and in the length of the head.

12. E. PELLU'CIDA, Alder and Hancock.

E. pellucida, A. & H. in Ann. N. H. 1st ser. xii. p. 234; Brit. Nud. Moll. fam. 3, pl. 19.

BODY slender, white, pellucid: *dorsal* and *oral tentacles* long, equal in length, white: *branchial processes* nearly linear, scarlet, with white tips; set in 5 or 6 clusters: *foot* having its anterior angles much produced. L. 0·8.

HABITAT: On a *Tubularia* from the fishing-boats, Cullercoats (Hancock); Ilfracombe (Broderick). [Shetland (Norman).]

13. E. LANDSBURGI, (*Landsburgii*) Alder and Hancock.

E. Landsburgii, A. & H. in Ann. N. H. 1st ser. xviii. p. 294; Brit. Nud. Moll. fam. 3, pl. 20.

BODY slender, violetcoloured: *dorsal tentacles* longish, slender, and slightly wrinkled, violetcoloured, with white tips: *oral tentacles* rather longer than the dorsal pair, and of the same colour: *head* rather narrow: *branchial processes* elliptical linear, orange-red, with white tips; set in 5 or 6 clusters: *foot* with the anterior angles shortish. L. 0·5.

HABITAT: Within tide-marks and in shallow water on the western shores of England, Wales, and Scotland; also at Burghead (Murray); [Weymouth (Gosse)]; Exmouth (Hincks); Channel Isles (Ansted). [Arcachon (Fischer).] This may possibly be the *Doris pedata* found on the Devonshire coast by Montagu.

D. *Branchial processes clustered: dorsal tentacles with a bulbous swelling: odontophore with a single smooth spine.* (Favorinus, *Gray*.)

14. E. ALBA, Alder and Hancock.

E. alba, A. & H. in Ann. N. H. 1st ser. xiii. p. 164; Brit. Nud. Moll. fam. 3, pl. 21.

BODY very slender, white: *dorsal tentacles* of a blackish-brown colour for about two-thirds up, above which they are white, with a bulbous swelling at a little distance from the apex: *oral tentacles* long, white, gracefully curved: *branchial processes* linear oblong, rather depressed, white, sometimes spotted or ringed with brown, with white tips; set in 5 or 6 clusters: *foot* with the anterior angles very long. L. 0·75.

HABITAT: On sponges and zoophytes in shallow water and between tide-marks, pretty generally diffused, but not common.

This elegant species is subject to great variety of colour and markings. The gills are sometimes of a brownish colour, with brown markings on the body; this variety, which is very rare in Britain, seems to be more plentiful in northern Europe, where it has been found on the shores of Sweden and Denmark [and in Kiel Bay].

15. E. CARNEA, Alder and Hancock.

E. carnea, A. & H. Brit. Nud. Moll. App. (24) p. ix.

BODY fleshcoloured, slender: *dorsal tentacles* rather long, dark olive-brown: *oral tentacles* white, about the length of the dorsal pair: *branchial processes* linear conical, rosecoloured, set in 7 clusters: *foot* with the anterior angles much produced. L. 0·5.

HABITAT: Dredged in Salcombe Bay (Mrs. Wyatt).

This obscure species is nearly related to *E. alba*, but differs in colour and in the apparent absence of the bulbous swelling on the dorsal tentacles. The tongue is of the same peculiar smooth and slender form.

E. *Branchial processes grouped on footstalks: tentacles smooth: odontophore with a single row of small spines.* (Calma, *A. & H.*)

16. E. GLAUCOÏDES, Alder and Hancock.

E. glaucoides, A. & H. Brit. Nud. Moll. fam. 3, pl. 22.

BODY depressed, white: head small: *tentacles* small, smooth: *branchial processes* nearly linear, white, with yellowish tips and a pale fulvous central gland; set in 11 clusters, each cluster rising from a common pedicle: *foot* broad, with the anterior angles short and acute. L. 0·5.

HABITAT: Under a stone at low-water mark, Herm Island (Alder).

Of this very curious animal a single individual has only yet been found. It partakes somewhat of the characters of the genus *Glaucus*, especially in the small size of the head and tentacles, and in the branchial processes being clustered on footstalks.

F. *Branchial processes in close-set rows: odontophore with a central spine and lateral denticulations.* (Cuthona, *A. & H.*)

17. E. Pea'chii, Alder and Hancock.

E. Peachii, A. & H. in Ann. N. H. 2nd ser. i. p. 19; Brit. Nud. Moll. fam. 3, pl. 10.

Body broadly oblong, tapering behind, yellowish or flesh-coloured: *dorsal tentacles* long, linear, smooth: *oral tentacles* one-third shorter, and set rather wide apart on the head, which is broad and semicircular or lunate in outline: *branchial processes* numerous, subclavate, rather obtuse, yellowish-brown, or fawncoloured, with white tips arranged in about 20 close-set rows, commencing on the sides of the head and extending nearly to the tail: *foot* broadish in front, and tapering to a blunt point behind; the anterior angles obtuse. L. 0·75.

Habitat: In deepish water, Fowey Harbour (Peach), Northumberland Coast (Alder). [Cumbrae (Robertson).]

18. E. nana, Alder and Hancock.

E. nana, A. & H. in Ann. N. H. 1st ser. ix. p. 36; Brit. Nud. Moll. fam 3, pl. 25.

Body rather broad, ovate oblong, yellowish-white: *dorsal tentacles* rather long, smooth, white: *oral tentacles* a little shorter than the dorsal pair, set rather far on the head, which is broad and shows a semicircular margin beyond them: *branchial processes* subclavate, rosecoloured, with white tips; set in 8 or 10 rather close rows, extending nearly to the tail, which is short and rather blunt: *foot* broad, transparent white, with the anterior angles rounded. L. 0·4.

Habitat: Under stones between tide-marks: Cullercoats and Whitley, Northumberland (A. & H.); Burghead (Murray). [W. Sweden (Lovén).]

This species comes very near to the last in some of its characters, especially in the broad form of the head, and in the obtuse angles of the foot. It is nevertheless very distinct.

19. E. STIPA'TA, Alder and Hancock.

E. stipata, A. & H. in Ann. N. H. 1st ser. xii. p. 233; Brit. Nud. Moll. fam. 3, pl. 22.

BODY rather broad, ovate-oblong, subdepressed, bright yellowish green: *dorsal tentacles* smooth, rather short and blunt: *oral tentacles* short and set wide apart on the head, which is rounded: *branchial processes* rather short and stout, ovate-oblong, bright bluish-green, paler and yellowish towards the apex; arranged in 9 or 10 close-set rows, nearly covering the back: *foot* rather broad, transparent white, with the anterior angles obtuse. L. 0·25.

HABITAT: On a *Sertularia* from deep water, Torbay (Alder).

A single individual of this pretty and well-marked *Eolis* was got in the above locality in 1842, since which time it does not appear to have been met with.

20. E. ANGULA'TA, Alder and Hancock.

E. angulata, A. & H. in Ann. N. H. 1st ser. xiii. p. 165; Brit. Nud. Moll. fam. 3, pl. 23.

BODY rather broad, subangulated, depressed, pale orange: *dorsal tentacles* short, slightly wrinkled, orangecoloured, with white tips: *oral tentacles* rather longer, whitish: *branchial processes* cylindrical, orangecoloured, spotted with white and having whitish tips; set in 10 or 12 rather close rows: *foot* broad, especially in the anterior portion, where the angles are a good deal produced and pointed; it tapers abruptly to a point behind. L. 0·4.

HABITAT: On a stone brought in by the fishing-boats at Cullercoats (A. Hancock). [Moray Firth (Macdonald); W. Sweden (Lovén); Normandy (Quatrefages, as *Eolidina paradoxa*).]

21. E. INORNA'TA, Alder and Hancock.

E. inornata, A. & H. in Ann. N. H. 1st ser. xvi. p. 315; Brit. Nud. Moll. Append. (25) p. ix.

BODY ovate, flattish, pale fawncoloured: *dorsal tentacles* short, slightly wrinkled: *oral tentacles* scarcely longer than the dorsal pair: *branchial processes* elliptic cylindrical, reddish-fawncoloured, spotted with brown and white; set in 9 rows: *foot* with the anterior angles a little produced and pointed. L. 0·5.

Habitat: Under a stone at low-water mark, Torbay (Alder). [? W. Sweden (Lovén).]

This obscure species, of which one specimen was got in 1845, requires further investigation. There is a possibility of its being either a variety of *E. angulata*, or the young of one of the many varieties of *E. papillosa*.

22. E. concinna, Alder and Hancock.

E. concinna, A. & H. in Ann. N. H. 1st ser. xii. p. 234; Brit. Nud. Moll. fam. 3, pl. 24.

Body oblong, pellucid white, tinged with buff or yellow: *dorsal tentacles* rather long, smooth, white: *oral tentacles* one-third shorter than the dorsal pair, arising from the upper surface of the lips: *branchial processes* oblong, nearly linear, purplish-brown and granulated internally; the outer surface pellucid, with a tinge of blue, giving them a metallic lustre; set in 9 or 10 rows: *foot* linear, pellucid; the anterior angles broad, and produced into blunt points. L. 0·5.

Habitat: On *Sertularia argentea* at low-water mark, Whitley, Northumberland (Hancock); Egremont, near Liverpool [on *Laomedea gelatinosa*] (Collingwood); [Cumbrae (Robertson). W. Sweden (Lovén); Christianiafiord (Asbjörnsen).]

A pretty species, though rather sober in colour. The glancing of the light on the papillæ when in motion gives them a silvery appearance.

23. E. oliva'cea, Alder and Hancock.

E. olivacea, A. & H. in Ann. N. H. 1st ser. ix. p. 35; Brit. Nud. Moll. fam. 3, pl. 26.

Body rather stout, yellowish-white, with opaque-white spots; a rosecoloured streak on each side of the head: *dorsal tentacles* linear, smooth, rather short, yellowish-white, with a band of rosecolour: *oral tentacles* rather shorter than the dorsal pair, set on the upper surface of the lips: *branchial processes* few, stout, cylindrical, of a yellowish olivecolour, with transverse bars of a darker shade, sometimes indistinct; tips pale; they are set in 6 or 8 rows of 3 or 4 each: *foot* with the anterior angles obtuse. L. 0·5.

HABITAT: Under stones between tide-marks, Whitley and Cullercoats, not rare (A. & H.); Ardrossan, Saltcoats, Rothesay, and Lamlash (Alder); Burghead (Murray); Penzance (Alder). [Dee estuary, Cheshire (Collingwood); Falmouth (Cocks); Shetland (Norman).]

This *Eolis* is subject to a little variation in colour; the olive sometimes assumes a reddish or greenish tinge. It may, however, generally be recognized by the red lines on the head and tentacles. The localities quoted will show that it is pretty generally diffused, though it is nowhere abundant.

24. E. AURANTI'ACA, Alder and Hancock.

E. aurantiaca, A. & H. in Ann. N. H. 1st ser. ix. p. 34; Brit. Nud. Moll. fam. 3, pl. 27.

BODY rather robust, buffcoloured: *dorsal tentacles* of moderate length, rosy-orangecoloured: *oral tentacles* shorter, whitish: *branchial processes* linear oblong, rather stout, purple-orange below, with a white ring above, and bright orange tips; set in 10 or 11 rather close rows, commencing at the sides of the head: *foot* pellucid white, tapering to a fine point behind; the anterior angles very obtusely rounded. L. 0·5.

HABITAT: Between tide-marks and in shallow water, Cullercoats and Whitley, Northumberland (Hancock). Ardrossan, Ayrshire; Fowey Harbour, Cornwall; not uncommon (Alder). Liverpool (Collingwood). [Lamlash (Landsborough); Shetland (Norman). W. Sweden (Lovén).]

E. aurantiaca has a considerable range. The south-country specimens are generally brighter-coloured than those in the north, the colour of the papillæ sometimes approaching scarlet in the under part. There is also occasionally a difference in the proportional colouring of the parts, the orange of the tips, however, being generally conspicuous.

25. E. PUSTULA'TA, Alder and Hancock.

E. pustulata, A. & H. Brit. Nud. Moll. fam. 3, pl. 46. f. 4, 5.

BODY rather slender, white, pellucid: *dorsal tentacles* shortish, linear, rather obtuse, blotched with opaque white at the tips: *oral tentacles* rather shorter than the dorsal pair, also tipped with opaque white: *branchial processes* long, linear, obtuse, pale orangecoloured, spotted with minute granules of opaque white; arranged in 9 or 10 close-set rows, extending close to the tail and with the posterior papillæ projecting beyond it: *foot* having its anterior angles rounded. L. 0·25.

HABITAT: On zoophytes from the deep-water fishing-boats at Cullercoats, rare (Alder).

Of this species only two individuals have yet been met with. It is distinguished from the other British *Eolides* by the pustulated character of the branchial papillæ, which are capable of great extension. The animal has the peculiar power of bending them at right angles. From the great transparency of the skin, the jaws appear through like two brown bands across the front of the head.

G. *Branchial processes in rather distant rows: odontophore denticulated, with the central spine a little prominent.* (Cavolina, *Cuvier* [*not Abildgaard*].)

26. E. COU'CHII, Cocks.

E. Couchii, Cocks in Naturalist, ii. p. 1, pl. 1. f. 2; A. & H. Brit. Nud. Moll. Append. p. x.

BODY rather stout, bluish-black, with opaque-white spots: anterior parts and tail white: *dorsal tentacles* rather long, filiform: *oral tentacles* rather short; both pairs having opaque-white spots: *branchial processes* oval-oblong, transparent white, with opaque-white spots; set in 4 distant rows of 3 papillæ each: *foot* much attenuated posteriorly. L. 1·75.

HABITAT: Under a stone at extreme low-water mark at Gwyllyn Vase, Falmouth (Cocks).

27. E. AMŒNA, Alder and Hancock.

E. amœna, A. & H. in Ann. N. H. 1st ser. xvi. p. 316; Brit. Nud. Moll. fam. 3, pl. 20.

BODY greenish-white, with brown markings and white spots: *dorsal tentacles* long, transparent, greenish-white, with white spots: *oral tentacles* about half the length of the dorsal pair, and similarly banded: *branchial processes* yellowish-green or olive, spotted with yellowish-white, often having a brownish base and two or three bands of brown spots above; tips transparent; they are set in 8 distant rows, the anterior close together, the others more distant: *foot* rather narrow, the anterior angles very little produced and slightly rounded. L. 0·3.

HABITAT: Dredged in Torbay and Fowey Harbour; not uncommon in the latter place (Alder). [Cumbrae, rare (Robertson).]

This pretty little species may be known from its congeners, *E. viridis* and *E. Northumbrica*, by its brown markings, and especially by the brown rings on the tentacles; the green is also more or less yellowish or olive.

28. E. NORTHUM′BRICA, Alder and Hancock.

E. Northumbrica, A. & H. in Ann. N. H. 1st ser. xiii. p. 165; Brit. Nud. Moll. fam. 3, pl. 31. f. 2, 3.

BODY rather slender, of a delicate greenish white: *dorsal tentacles* moderately long, white and strongly wrinkled above, with the apices truncated: *oral tentacles* nearly as long as the dorsal pair, white and obtuse at the tips: *branchial processes* stout and subclavate, of a cold bluish green, with white tips, set in 9 rather distant rows: *foot* with the anterior angles blunt and a little produced. L. 0·25.

HABITAT: On a Coralline from the fishing-boats, Cullercoats (Hancock); rocks at the same place (Norman and Mennell).

29. E. ARENI′COLA, Forbes.

E. arenicola (Forbes, MS.), A. & H. Brit. Nud. Moll. fam. 3, pl. 31. f. 1.

BODY white, rather long and slender: *dorsal tentacles* yellowish-white, long, smooth, and tapering: *oral tentacles* nearly as long as the dorsal pair, slender, tapering, set on the upper edge of the lip, which is margined with yellow: *branchial processes* rather long, linear, and tapering above, of a dark bottle-green colour for two-thirds up, above which they are pale yellow, with colourless tips; they are set in about 15 rows, the papillæ becoming very small towards the sides: *foot* with the anterior angles obtuse. L. 0·75.

HABITAT: Dredged in 10 fathoms on weedy ground, Menai Straits (Forbes).

30. E. GLOTTENSIS, Alder and Hancock.

E. Glottensis, A. & H. in Ann. N. H. 1st ser. xviii. p. 293; Brit. Nud. Moll. fam. 3, pl. 29.

BODY greenish-white: *dorsal tentacles* rather long and obtuse, of the same colour as the body: *oral tentacles* about two-thirds the length of the dorsal pair, obtuse, set on the upper-side of the lip: *branchial processes* stout, blackish-green, with golden-yellow tips, a little inclining to orange; set in 8 or 9 rows, the first 3 rather close together, the others more distant: *foot* notched in front, with the angles slightly produced and rounded. L. 0·4.

HABITAT: Dredged on *Pecten opercularis* in Lamlash Bay (Alder).

31. E. CÆRU′LEA, Montagu.

Doris cærulea, Mont. in Linn. Trans. vii. p. 78, pl. 7. f. 4, 5. *E. cærulea,* A. & H. Brit. Nud. Moll. p. 51.

BODY slender, pale pellucid-green: *dorsal tentacles* long, slightly tapering, greenish-white, with opaque-yellow spots: *oral tentacles* very short, greenish: *branchial processes* linear-fusiform, stoutish, green below and blue above, with a rim of pale yellow, and bright orange-red tips; set in 10 rows, the

4 anterior ones rather close together, the rest more distant: *foot* slender, with the anterior angles produced and rather obtuse. L. 0·5.

Habitat: Devonshire (Montagu); Weymouth [in 6 f.] (Thompson); Salcombe Bay (Hincks).

This beautiful *Eolis* had not been met with since it was first described by Montagu, until Mr. Wm. Thompson fortunately dredged it in Weymouth Harbour in 1858. The Rev. T. Hincks met with it at Salcombe in the following year.

32. E. vi'ridis, Forbes.

Montagua viridis, Forb. in Ann. N. H. 1st ser. v. p. 106, pl. 2. f. 12. *E. viridis*, A. & H. Brit. Nud. Moll. fam. 3, pl. 32.

Body slender, white, slightly tinged with green: *dorsal tentacles* rather long, smooth, greenish-white: *oral tentacles* nearly as long as the dorsal pair, set on the upper surface of the lip: *branchial processes* nearly linear, rather stout, bright bluish-green varying to grass-green, with darker granules and opaque-white spots; tips opaque-white; they are set in 10 rather distant rows, the first 4 being rather closer than the rest: *foot* with the anterior angles a little produced and obtuse. L. 0·3.

Habitat: Isle of Man and Cornwall (Forbes); Saltcoats and Portincross, Ayrshire (D. Landsborough, jun.); Burghead (Murray).

33. E. purpurascens, Fleming.

Eolida purpurascens, Flem. Phil. Zool. ii. p. 470, pl. 4. f. 2. *Eolis purpurascens*, A. & H. Brit. Nud. Moll. p. 51 and App. p. xi.

Body slender, pink: *dorsal tentacles* linear: *oral tentacles* very short: *branchial processes* subclavate or filiform; set in 5 rows of 3 papillæ each. L. 1.

Habitat: Firth of Tay (Fleming).

The above description contains all we know of this species, which has not been met with since its discovery by Dr. Fleming.

H. *Branchial processes inflated: odontophore with large denticles and a stout central spine; two separate lateral spines.*

34. E. CINGULA'TA, Alder and Hancock.

E. hystrix, A. & H. in Ann. N. H. 1st ser. ix. p. 35. *E. cingulata*, Brit. Nud. Moll. fam. 3, pl. 28.

BODY slender, tapering to a fine point behind, white, with olive-brown spots and blotches: *dorsal tentacles* long and slender, white, with an orange-brown band: *oral tentacles* short, also banded with orange-brown: *branchial processes* elliptic-oblong or fusiform, yellowish-white, with three olive-brown bands; set in 8 or 9 rows and diverging at the tips: *foot* with the anterior angles slightly produced and rounded. L. 0·4.

HABITAT: Among the rocks at low-water mark, Cullercoats, rare (Alder). [Cumbrae (Robertson); W. Sweden (Lovén).]

35. E. VITTA'TA, Alder and Hancock.

E. vittata, A. & H. in Ann. N. H. 1st ser. ix. p. 35; Brit. Nud. Moll. fam. 3, pl. 29. f. 1–4.

BODY buff or fawncoloured, with ferruginous markings: *dorsal tentacles* long, linear, buff below, with a faint ferruginous band, and white above: *oral tentacles* rather shorter than the dorsal pair, and similarly banded: *branchial processes* subclavate or nearly linear, buffcoloured, with two or three ferruginous bands, more or less distinct, and pale yellow tips; they are set in 6 or 7 rather distant rows: *foot* with the anterior angles obtuse and not much produced. L. 0·3.

HABITAT: On Zoophytes from deep water, Cullercoats, rare (Hancock).

This species has considerable resemblance to the last, but differs from it in colour, as well as in the form of the branchial papillæ. The latter have sometimes a pinkish tinge.

36. E. PICTA, Alder and Hancock.

E. pallida, A. & H. in Ann. N. H. 1st ser. ix. p. 35. *E. picta*, Brit. Nud. Moll. fam. 3, pl. 33.

BODY rather stout, yellowish-white, more or less spotted and blotched with rich orange-brown : *dorsal tentacles* long, slightly tapering, white, with a central band of orange-brown : *oral tentacles* shorter than the dorsal pair, also with a brown band : *branchial processes* much inflated, ovate, tapering to a fine point above, spotted with orange-brown and opaque white, and frequently having a minute ring of orange near the tip; the central gland is yellowish; the papillæ are set in 7 or 8 rows, large on the back and small towards the sides : *foot* with the anterior angles rounded. L. 0·5.

HABITAT : On most of our coasts, but not common. A pale variety occurs, which was described under the name of *pallida*; the normal form, however, is generally brightly coloured.

37. E. TRI′COLOR, Forbes.

Eubranchus tricolor, Forb. Mal. Mon. p. 5. *Eolis tricolor*, A. & H. Brit. Nud. Moll. fam. 3, pl. 34.

BODY ovate-oblong, rather broad, of a pale buffish yellow, inclining to fawncolour on the head and back : *dorsal tentacles* moderately long, stoutish, fawncoloured : *oral tentacles* about half the length of the dorsal pair, and rather paler in colour : *branchial processes* large, stout, ovate, abruptly tapering to a point above, where they are encircled with a ring of bright golden yellow; they are transparent white, with a linear central gland of a violetcolour, fading to yellowish-brown below; set in 13 or 14 rows : *foot* rather broad, with the anterior angles rounded. L. 1.

HABITAT : Ballaugh, in the Isle of Man, and Anglesea (Forbes); Belfast Lough (Thompson); Cullercoats and Falmouth (Alder); Burghead, common (Murray). [W. Sweden (Lovén). "Rolls itself up into a ball, when teased," Gordon.]

This beautiful species is the *E. purpurea* of Alder and Hancock in the 'Annals of Natural History;' and probably their *E. amethystina* may prove to be a variety of the same.

38. E. FARRA'NI, Alder and Hancock.

E. Farrani, A. & H. in Ann. N. H. 1st ser. xiii. p. 164; Brit. Nud. Moll. fam. 3, pl. 35.

BODY yellowish-white or purplish, with orange spots: *dorsal tentacles* rather long, white below and orange above: *oral tentacles* shortish, pale orange: *branchial processes* ovate-oblong, inflated, yellowish-white, or occasionally lilac on the surface, with the central gland of a pale strawcolour; the tips have a ring of bright orange; they are set in 9 or 10 rows: *foot* nearly linear, with the front angles rounded. L. 0·5.

HABITAT: Malahide, near Dublin (Alder); Burghead (Murray); St. Andrews (M'Intosh). [North of France (Quatrefages, as *Amphorina Alberti*).]

This is rather a rare species. A single individual only was dredged at Malahide, which was nearly colourless, excepting the orange spots and rings; but several specimens have since been found at Burghead by Mr. Murray with more or less of a purple or lilac hue on the surface. This variety appears to be what is described under the name of *E. Andreapolis* by Dr. M'Intosh.

39. E. ADELA'ÏDÆ, Thompson.

E. Adelaidæ, Thomps. in Ann. N. H. 3rd ser. v. p. 49. *E. Robertianæ*, M'Intosh in Proc. R. S. Edinb.

BODY rather slender, pellucid orange-red: *dorsal tentacles* rather long, smooth, orange-red, with yellow tips, having a pale space on each side of the back behind, on which the eyes are placed: *oral tentacles* a little shorter than the dorsal pair and of the same colour: *branchial processes* elliptical, inflated, of the same colour as the body, but deeper towards the tips; the central gland is yellowish; they are set in 12 or 13 transverse rows: *foot* tinged with orange-red, truncated in front, with the angles rounded. L. 0·5.

HABITAT: Dredged in Weymouth Bay [in 6 f., feeding on *Plumularia*] by Mr. Wm. Thompson. The species varies in intensity of colour, the first observed being nearly white. *E. Robertianæ* of Dr. M'Intosh, St. Andrews, is a variety of this.

40. E. EXI'GUA, Alder and Hancock.

E. exigua, A. & H. in Ann. N. H. 2nd ser. i. p. 292; Brit. Nud. Moll. fam. 3, pl. 37.

BODY yellowish-white, marbled with brown or olive: *dorsal tentacles* longish, white, with one or sometimes two bands of brown: *oral tentacles* short, with a brown band: *branchial processes* ovate, abruptly pointed, white, with 2 or 3 bands of brown, reddish at the tips; set in 5 rows of one or two each: *foot* nearly linear, and scarcely produced at the sides in front. L. 0·2.

HABITAT: On *Laminariæ* and *Fuci* in shallow water, especially on those fronds that bear the *Laomedea geniculata* [and *L. gelatinosa*]; probably not uncommon, but seldom observed on account of its small size. Fowey Harbour; Bangor, North Wales; Bamburgh and Cullercoats, Northumberland (Alder and Hancock); Burghead (Murray); St. Andrews (M'Intosh); and Liverpool (Collingwood). [Falmouth (Cocks); W. Sweden (Lovén); Kiel Bay and Little Belt (Meyer and Möbius). According to the last-named authors this is possibly *Limax tergipes* of Forskål, *Doris lacinulata* of Gmelin, and *Tergipes bullifer* of Lovén.]

I. *Branchial processes in a single row on each side: odontophore denticulated, without lateral spines.* (Tergipes, *Cuv.*)

41. E. DESPECTA, Johnston.

Eolidia despecta, Johnst. in Loud. Mag. N. H. viii. p. 378, f. 35. *Eolis despecta*, A. & H. Brit. Nud. Moll. fam. 3, pl. 37.

BODY slender, white, with an undulating olivaceous line in the middle of the back from the gastrohepatic vessel appearing through: *dorsal tentacles* long, reddish at the sides towards the base: *oral tentacles* very short: *branchial processes* fusiform, expanding a little upwards, and ending in obtuse tips; white, marbled with olive or greenish, in the centre, and often having a fulvous ring near the tip, which is white; they are set singly, and alternate, 4 on each side: *foot* narrow, rounded in front. L. 0·25.

Habitat: On Corallines and *Laminariæ* in shallow water, sometimes in company with the last; pretty generally diffused on our coasts, but not common.

Family IV. PROCTONO'TIDÆ, Alder and Hancock.

Mantle more or less distinct: *dorsal tentacles* non-retractile, without sheaths: *oral tentacles* small or none: *branchial processes* fusiform, linear, arranged round the mantle and in front of the head: *vent* generally dorsal: *mouth* armed with corneous jaws.

Genus I. PROCTONO'TUS [*], Alder and Hancock.

Body depressed: *dorsal tentacles* simple, linear, without uniting crest: *oral tentacles* originating in a veil: *branchial processes* fusiform, arranged along a ridge of the mantle on the sides of the back and in front of the head: *vent* posterior, dorsal: *mouth* with corneous jaws and a broad denticulated odontophore.

This genus was characterized in the 'Annals of Natural History' for March 1844 under the name of *Venilia*; but the authors, subsequently finding that name preoccupied, changed it in the following number of the same work to *Proctonotus*.

Proctonotus mucroni'ferus, Alder and Hancock.

Venilia mucronifera, A. & H. in Ann. N. H. 1st ser. xviii. p. 161. *Proctonotus mucroniferus*, Brit. Nud. Moll. fam. 3, pl. 42.

Body ovate-oblong, depressed, fawncoloured, marbled with brown: *dorsal tentacles* simple, corrugated, fawncoloured: *oral tentacles* short, originating in a subbilobed veil: *branchial processes* inflated, ovate or inversely pear-shaped, tapering to a blunt point above, and strongly mucronated over the surface;

[* From the vent being dorsal.]

they are hyaline-white, with a thin yellowish central gland extending about halfway up, set rather irregularly on the sides, about 3 abreast, those next the back large, the outer ones small; 4 large papillæ are in front of the head: *foot* broad, slightly bilobed in front, without anterior angles, and tapering to a point behind. L. 0·5.

Habitat: Dredged in shallow water in Malahide Bay, near Dublin (Alder).

Genus II. ANTI′OPA [*], Alder and Hancock.

[Pl. II. f. 4.]

Body ovate-oblong, depressed: *dorsal tentacles* laminated, and united together below by an arched crest: *oral tentacles* short, with or without a slight veil: *branchial processes* arranged upon a pallial ridge along the sides of the back and round the head in front: *vent* posterior, dorsal: *mouth* with large corneous jaws and a denticulated tongue, containing numerous smooth lateral spines and a single central one.

This genus was named *Janus* by Verany in 1844, and *Antiopa* by Alder and Hancock in 1848; but the name *Janus*, having been previously occupied for a genus of insects, is inadmissible according to the rules of nomenclature now generally followed, and which it is desirable should in all cases be complied with, where it does not interfere with long-established use.

1. Antiopa crista′ta, Delle Chiaje.

Eolis cristata, Delle Chiaje, Desc. Stor. An. Nap. pl. 88. *A. cristata*, A. & H. Brit. Nud. Moll. fam. 3, pl. 44. f. 1–7.

Body ovate, rather depressed, buffcoloured or whitish: *dorsal tentacles* conical, obliquely laminated, truncated at top, yellow with white tips, united at the base for about a quarter of their height by an arched crest, of a lobated or radiated structure: *oral tentacles* short, linear, set at the sides of the head on a kind of conical hood: *branchial processes* very nu-

[* A mythological name.]

merous, large, inflated, smooth, transparent, showing a narrow brown central gland, which is bifurcated above; the tips are of an opaque bluish white, with a brilliant metallic lustre; the papillæ are thickly set on the sides and round the head in front without apparent order, meeting behind near the tubercular vent, beyond which an opaque-white line extends to the tail: *foot* rather broad, deeply grooved in front, and extending to a pointed tail behind. L. 1·5.

HABITAT: On most parts of our coast, especially towards the south and west; not common.

2. A. HYA′LINA, Alder and Hancock.

A. hyalina, A. & H. Brit. Nud. Moll. fam. 3, pl. 44. f. 8–12.

BODY elliptical, pellucid yellowish-white, with reddish-brown markings: *dorsal tentacles* rather short, stout, and obtuse, fawn-coloured, spotted with brown and white; they are obliquely laminated, and united at the base by a semicircular crest of the same colour: *oral tentacles* short, proceeding from a semicircular veil: *branchial processes* numerous, elliptic-oblong, tapering to a blunt point, and strongly mucronated on the upper portion; they are pellucid, sprinkled with brown and opaque-white, and showing a stout, central, fawncoloured gland, which extends about two-thirds up; they are densely and irregularly arranged on a ridge round the back and head: *foot* strongly grooved in front, with the lateral angles rounded. L. 0·4.

HABITAT: Hilbro' Island, mouth of the Dee, Cheshire (Byerley [and Collingwood]).

This species comes very near to *Proctonotus mucroniferus*, from which it principally differs in the characters of the dorsal tentacles and crest, peculiar to the genus *Antiopa*.

Family V. DOTO′NIDÆ [*].

Mantle wanting: *tentacles* 2, dorsal, with sheaths: *branchial processes* ovate, muricated, set in a single series on each side: *mouth* without jaws.

[* A purist would say, "*Dotoïdæ*."]

Genus DOTO [*], Oken.

[Pl. II. f. 5.]

Body nearly linear: *tentacles* linear, smooth, retractile within plain sheaths: *branchial processes* elliptical, strongly muricated, set in a single series on each side of the back: *head* with a slight veil: *vent* latero-dorsal: *odontophore* narrow, consisting of a single denticulated plate with a central spine: no jaws.

1. Doto fra′gilis, Forbes.

Melibœa (Doto) fragilis, Forb. Mal. Mon. p. 4, pl. 1. f. 4. *D. fragilis*, A. & H. Brit. Nud. Moll. fam. 3, pl. 5.

Body oblong, of a uniform yellowish-brown or olive, with occasionally a few tubercular spots on the back and sides: *tentacles* slender, tapering above, issuing from shortish expanded sheaths: *head* with a short veil, produced a little at the sides: *branchial processes* stout, conical, with about 10 rows of tubercles and pointed tips; there are about 9 close-set papillæ on each side, reaching nearly to the tail: *foot* linear and slightly notched in front. L. 1.

Habitat: Not uncommon in the [Laminarian as well as the] Coralline zone on nearly all parts of our coast. [W. Sweden, (Lovén).]

This is the *Melibœa pinnatifida* of Johnston.

2. D. pinnati′fida, Montagu.

Doris pinnatifida, Mont. in Linn. Trans. vii. p. 78, pl. 7. f. 2, 3. *Doto pinnatifida*, A. & H. Brit. Nud. Moll. fam. 3, pl. 45. f. 1–3.

Body elongated, nearly linear, yellowish or olive, spotted with brown and black: *tentacles* moderately long, plain, issuing from sheaths which are a little expanded at the top, and surrounded by a row of black spots: *head* with an arched veil: *branchial processes* ovate-conical, slightly pedunculated, with about 6 whorls of slender papillose tubercles, and a terminal one at the apex, each tipped with black; there are from 7 to 9 papillæ on each side of the back, extending nearly to the tail;

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[*] A sea-nymph.]

a line of tubercles with black tips runs along each side of the body: *foot* narrow, a little arched in front, with the lateral angles rounded. L. 0·4.

HABITAT: Devonshire (Montagu); Guernsey (Alder); rare.

3. D. CORONA'TA, Gmelin.

Doris coronata, Gm. ed. Linn. S. N. p. 3105. *Doto coronata,* A. & H. Brit. Nud. Moll. fam. 3, pl. 6.

BODY rather slender, linear, yellowish-white, spotted with rosecolour or purple on the back and sides: *tentacles* moderately long, issuing from longish trumpet-shaped sheaths: *head* with a slight veil, straight in front and produced at the sides: *branchial processes* elliptical, pedunculated, with 4 or 5 irregular rows of tubercles and a terminal one, each with a purple spot at the tip; the papillæ are transparent, with a pinkish centre inclining to brownish or yellowish; there are from 5 to 7 papillæ on each side: *foot* linear, white, without anterior angles. L. 0·5.

HABITAT: On small zoophytes from low-water mark to deep water; common on most parts of the British coast. [I observed it feeding on the polyparies of *Tubularia indivisa*, J. G. J.] It is also found on the Scandinavian, Dutch, and French coasts. [Nice (Verany).]

This pretty and well-known species has been referred to many genera by different authors. Included first in *Doris*, it was transferred to *Tritonia* by Lamarck, to *Tergipes* by D'Orbigny, to *Scyllæa* by Bouchard-Chantereaux, and to *Melibæa* by Johnston.

4. D. CUSPIDA'TA, Alder and Hancock.

D. cuspidata, A. & H. in Ann. N. H. 3rd ser. x. p. 264.

BODY slender, white or yellowish, spotted with pink or purple: *head* with an arched veil, produced into recurved points at the sides: *tentacles* slender, tapering a little upwards; the sheaths trumpet-shaped, with scalloped margins: *branchial processes* ovate-conical, with four rows of strongly pointed conical tubercles, and a terminal one at the apex; the tips are without spots; papillæ 6 on each side: *foot* narrow, a little expanded in front. L. 0·5.

HABITAT: In 75–80 f. on the "Outer haaf," off the Whalsey Skerries, Shetland (Jeffreys and Waller).

This species, of which a single specimen was obtained during the Shetland dredging-expedition in 1861, comes very near to *D. coronata*, from which it differs in the papillæ having much more pointed tubercles, without the terminal spot. The tentacular sheaths also have scalloped margins, and the veil is more arched than in *D. coronata*.

Family VI. DENDRONO'TIDÆ.

Mantle wanting: *tentacles* 2, dorsal, with or without sheaths: *branchial processes* branched or papillary, set in single series down each side: *mouth* with jaws.

Genus I. DENDRONO'TUS [*], Alder and Hancock.
[Pl. II. f. 6.]

BODY limaciform: *tentacles* laminated, retractile within branched sheaths: *head* with a branched veil: *branchial processes* branched, set in single series on the sides of the back: *vent* lateral: *odontophore* rather narrow, with a large central spine and several smaller lateral ones increasing centrally; all the spines are minutely denticulated.

DENDRONOTUS ARBORESCENS, Müller.

Doris arborescens, Müll. Prod. p. 229. *Dendronotus arborescens*, A. & H. Brit. Nud. Moll. fam. 3, pl. 3.

BODY elongated, rather compressed laterally, reddish- or yellowish-brown, marbled with darker brown and spotted with white: *tentacles* laminated, yellowish, retractile within long narrow sheaths, branched at the top: *head-veil* with from 4 to 6 branched processes: *branchial processes* with a nearly

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[* Back having a tree-like appearance.]

cylindrical stem, giving off numerous branches; there are 6 or 7 in single series on each side: *foot* narrow, rounded in front, with the sides thin and formed for clasping. L. 1–2.

Habitat: On most parts of our coasts, from low-water mark to deep water, not uncommon. Its range extends northwards to the Scandinavian and Greenland seas; and it is also met with on the Atlantic coast of North America. [North of France, as *Scyllæa pelagica* (Bouchard-Chantereaux, *fide* Fischer); Brittany (Cailliaud).]

This beautiful mollusk varies a good deal in size as well as in colour. A white variety is the *Tritonia lactea* of Thompson; and a small variety of a delicate pink colour is the *T. pulchella* of Alder and Hancock.

Genus II. HERO [*], Lovén.

Body limaciform: *tentacles* linear, smooth, without sheaths: *head* with a plain veil: *branchial processes* branched or umbellated, set in single series on the sides of the back: *odontophore* with a large denticulated central spine, and 2 simple lateral ones.

This genus was first described by Professor Lovén under the name of *Clælia*; but finding that that name had been before used to designate more than one genus in zoology, he subsequently changed it to *Hero*.

Hero formo'sa, Lovén.

Clælia formosa, Lovén in Öfv. K. Vet. Ak. Förh. 1844; Index Moll. Scand. p. 7.

Body rather slender, transparent white or of a pale rosy hue, with three lines of opaque white (one on the back and one along each side): *head-veil* expanded, arched, notched in front, and produced and curved at the sides: *tentacles* linear, slender, smooth: *branchial processes* pedunculated, and branching laterally at the top in an umbellated form, with truncated

[* A mythological name.]

tips, set in single series, 6 on each side; the first pair are in front of the tentacles: *foot* rather broad, rounded in front and slightly produced at the sides. L. 1.

Habitat: Dredged on the coast of Northumberland by Mr. G. S. Brady, and in the Frith of Clyde by Mr. A. Robertson. [The Minch, off Loch Ewe, in 60 f. (J. G. J.).]

This rare and interesting species is a recent acquisition to the British fauna. It was discovered on the Swedish coast by Professor Lovén.

Genus III. LOMANOTUS [*], Verany.

Body limaciform, subquadrilateral: *head* with a short veil: *tentacles* laminated, with sheaths: *branchial processes* papillose, or foliaceous, arranged in a nearly continuous line on a slight pallial ridge or rudimentary mantle: *foot* linear: *odontophore* broad, with numerous denticulated spines, which decrease centrally; no central spine.

Verany described this genus in the 'Revue Zoologique' for 1844. His name is consequently prior to that of *Eumenis* given to the same genus by Alder and Hancock in the following year.

1. Lomanotus marmoratus, Alder and Hancock.

Body a good deal angulated, olivaceous or fawncoloured, marbled with dark brown and white: *head* with a small tuberculated veil: *tentacles* subclavate, strongly laminated, issuing from short, rather tight sheaths with smooth margins: *branchial processes* running in a continuous undulating line of papillæ down each side of the back to the tail; they are fawncoloured, with white edges: a line of dark brown markings runs down the centre of the back on a white ground, and the sides of the body are marbled with longitudinal streaks of dark brown and white: *foot* narrow, with the front angles produced into longish processes. L. 0·5.

[* From the fringes on its back.]

HABITAT: Dredged in deepish water, Torbay (Alder). Only one specimen was found. [In 80 f., Outer haaf, Whalsey Skerries, Shetland (Jeffreys and Peach).]

2. L. FLA'VIDUS, Alder and Hancock.

Eumenis flavida, A. & H. in Ann. N. H. xviii. p. 293. *L. flavidus*, Brit. Nud. Moll. fam. 3, pl. 41.

BODY lemoncoloured above, white below: *veil* small, with four tubercular points: *tentacles* subclavate or fusiform, pale yellowish-white, issuing from shortish sheaths, tuberculated round the margin: *branchial processes* papillose, set on a waved pallial ridge down each side of the back; the papillæ are short, with the exception of 3 on each side, which are longer than the rest and nearly linear; each papilla is encircled by a band of fawncolour: *foot* linear, with the anterior angles produced into tentacular points. L. 0·25.

HABITAT: A single individual was dredged in 3 or 4 fathoms water in Lamlash Bay (Alder).

3. L. PORTLAN'DICUS, Thompson.

L. Portlandicus, Thomps. in Ann. N. H. 3rd ser. v. p. 50.

BODY depressed, quadrilateral, pellucid white, tinged with brownish yellow on the back, and pale orange-red in front: *veil* with two longish tentacular processes on each side: *tentacles* elliptical, closely laminated, issuing from tall narrow sheaths of an orange-red colour above, the margin divided into 6 finely pointed filaments: *branchial processes* consisting of an expanded and undulated pallial ridge on each side of the back, fringed with short orange papillæ which are tipped with white: *foot* linear, with the anterior angles much produced and recurved. L. 1·75.

HABITAT: Two examples of this fine species were dredged at different times by Mr. Wm. Thompson in Weymouth Bay.

Family VII. SCYLLÆ'IDÆ.

Body compressed: *mantle* produced into lateral lobes, which bear the branchial processes: *tentacles* with sheaths: *mouth* armed with corneous jaws.

Genus SCYLLÆ'A [*], Linné.

[Pl. III. f. 1.]

Body strongly compressed laterally and produced into large erect lobes on each side of the back, on the inner surface of which the plumose or tufted branchial processes are scattered: *head-veil* rudimentary: *tentacles* laminated, with large sheaths: *vent* lateral: *odontophore* broad, with numerous lateral spines and a broad central one; all the spines are denticulated.

Scyllæa pela'gica, Linné.

S. pelagica, Linn. S. N. p. 1094; A. & H. Brit. Nud. Moll. p. 47.

Body higher than broad, creamcoloured, transparent: *tentacles* rather small, laminated, issuing from large, compressed, trumpet-shaped sheaths, frilled posteriorly: *branchial processes* consisting of two lobes on each side of the back (which are large, flattened, and rather irregularly shaped, each bearing tufts of branchial filaments over their inner surface), and of a central posterior, crest-shaped lobe (also bearing filaments) towards the tail: *foot* linear, the sides thin and capable of being drawn together for clasping. L. 1·5.

Habitat: Three living specimens were met with by Mr. Cocks in 1847, adhering to a weather-beaten *Laminaria bulbosa* cast on shore at Falmouth.

This is a pelagic species, and is usually found on the floating gulf-weed of the Atlantic; but this instance of its occurrence on a *Laminaria* shows that it may occasionally be an inhabitant of our coast. [Ægean, 4 f. (Forbes).]

[* Belonging to the classical rock *Scylla*.]

Family VIII. TRITONI'IDÆ [H. & A. Adams].

Body with a small or rudimentary mantle, bearing on its margin the *branchial processes*, which are plumose or lamellated: *head* with a veil: *mouth* with corneous jaws: *tentacles* 2, dorsal: *vent* lateral.

Genus TRITO'NIA [*], Cuvier.

[Pl. III. f. 2.]

Body limaciform, subquadrate, with a rudimentary mantle or distinct pallial margin: *head-veil* large, fringed or papillose: *tentacles* fasciculated, retractile within sheaths: *branchial processes* plumose or lamellated, arranged along the pallial ridge on the sides of the back: *odontophore* broad, with numerous lateral spines, a tricuspid central spine, and a broad plate on each side of it: *jaws* very large.

1. Tritonia Hombergi, (*Hombergii*) Cuvier.

T. Hombergii, Cuv. Mém. du Mus. i. p. 483, pl. 31. f. 1, 2; A. & H. Brit. Nud. Moll. fam. 2, pl. 2.

Body broadly oblong, subconvex, varying in colour from dark purple-brown to light brown, fleshcolour, and yellowish-white; it is covered on the back with large, unequal, soft, warty tubercles: *head-veil* large, strongly bilobed and fringed on the edge: *tentacles* stout, bearing a fasciculus of branched filaments, and a stout, truncated process behind; they are retractile within widish sheaths, which are everted and a little undulated at the top: *branchial processes* laminated or leaf-like, set along the pallial margin on each side of the back, and extending nearly to the tail, forming nearly continuous irregular-sized tufts, the larger ones turned upwards on the back: *foot* rather broad, rounded in front. L. 4–6.

Habitat: In deep water on all parts of the British coast, but not very common.

This is the largest of our Nudibranchs, sometimes reaching 7 or 8 inches in length. Its range appears to extend along the whole of the eastern shores of Europe. [W. Sweden

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[* A surname of Minerva.]

(Lovén).] It is the *Tritonia atrofusca* of Macgillivray; and his genus *Sphærostoma* was founded on an imperfect specimen of the present species.

2. T. ALBA, Alder and Hancock.

T. alba, A. & H. Brit. Nud. Moll. p. 46, and App. p. vi.

BODY rather depressed, transparent-white, with opaque-white transverse markings, smooth or very slightly tuberculated: *head-veil* bilobed, with irregular digitations: *tentacles* with slightly branched filaments, retractile within rather wide sheaths with smooth edges: *branchial processes* imperfectly bipinnate, on each side 4 or 5, with intermediate smaller ones, set on an expanded and waved pallial margin: *foot* moderately broad. L. 0·75.

HABITAT: From the fishing-boats at Cullercoats; rare (Alder).

3. T. PLEBEIA, Johnston.

T. plebeia, Johnst. in Edinb. New Phil. Journ. v. p. 77; A. & H. Brit. Nud. Moll. fam. 2, pl. 3.

BODY subquadrate, yellowish (or rarely greenish), with brown markings on the sides of the back, which are interrupted opposite to each branchial tuft; sides of the body generally marbled with purple-brown: *head-veil* nearly entire, with from 6 to 8 digitations: *tentacles* smooth and transparent below, above fasciculated with slender branched filaments; they issue from small sheaths with smooth margins: *branchial processes* small, bipinnate, about 5 or 6 on each side, with sometimes smaller intermediate ones, set on a very slight pallial ridge: *foot* narrow, rounded in front. L. 1.

HABITAT: On *Alcyonium digitatum* and other zoophytes in the laminarian zone; frequent, especially on the east coast. [W. Sweden (Lovén); Ægean, 25 f. (Forbes).]

4. T. LINEATA, Alder and Hancock.

T. lineata, A. & H. in Ann. N. H. 2nd ser. i. p. 191; Brit. Nud. Moll. fam. 2, pl. 4.

BODY very slender, subquadrate, transparent-white, with a line of opaque white along each side of the back, which bend towards each branchial tuft: *head-veil* with four longish linear digitations: *tentacles* with a fasciculus of laminated or slightly branched filaments, issuing from longish and narrow sheaths: margins undulated and slightly mucronated: *branchial processes* small, pinnate, 5 or 6 on each side, set on a slight pallial margin: *foot* narrow, rounded in front. L. 0·7.

Habitat: Under large stones between tide-marks, Scarborough (Alder); Ilfracombe (Broderick); Channel Isles (Ansted).

Suborder III. ACANTHOBRANCHIATA.

Gills plumose, surrounding the vent on the medio-dorsal line.

Family I. POLYCE'RIDÆ.

Mantle small or obsolete, spiculose, generally with marginal appendages: *dorsal tentacles* variable: *oral tentacles* variable, sometimes wanting: *mouth* with a denticulated prehensile tongue or odontophore, and generally a spinous collar or horny jaws.

The *Polyceridæ*, though resembling each other in general form, are very variable in their other characters; so that it has been found necessary to constitute out of them several genera, some of which contain only a small number of species.

* *Dorsal tentacles retractile within sheaths.*

Genus I. ÆGI'RUS *, Lovén.

Body stout, convex, tapering behind, covered with large tubercles: *mantle* indistinct, forming a veil over the head, and a tuberculated ridge on each side: *dorsal tentacles* linear, smooth, without laminæ, retractile within lobated sheaths:

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* From Ægir, the god of the ocean in Scandinavian mythology.

oral tentacles indistinct: *gills* plumose, partially surrounding the vent (which is on the median line), non-retractile: *mouth* with a broad spinous tongue and an upper corneous jaw.

This genus contains only one known species.

ÆGIRUS PUNCTILU'CENS, D'Orbigny.

Polycera punctilucens, D'Orb. in Mag. de Zool. vii. p. 7, pl. 106. *Æ. punctilucens*, A. & H. Brit. Nud. Moll. fam. 1, pl. 21.

BODY stout, rather elevated in the centre of the back, and tapering behind, purple-brown, sprinkled with white and darker brown spots, and covered with large, obtuse, cylindrical or subclavate tubercles; interspersed between these are several circular velvety-brown areas containing each a central brilliant greenish-blue gem-like spot, with a circle of dark brown spots surrounding the area: *dorsal tentacles* linear, smooth, and obtuse, with two or three reddish-brown bands; they issue from sheaths surmounted by five large conical lobes: *oral tentacles* indistinct: *gills* or branchial plumes 3, large, tripinnate, whitish, in front of which are 3 large, branched, tubercular processes. L. 0·75.

HABITAT: Under stones among rocks near low-water mark; rare, but pretty generally diffused. It was first obtained on our coasts near Campbeltown, in Argyleshire, by Professor E. Forbes, who published it under the name of *Doris Maura*, unaware that it had been previously described by D'Orbigny. Other localities are, Courtmasheny Harbour, Ireland (Allman); Ardrossan and Lamlash (Alder); Burghead (Murray); near Fowey, Cornwall (Peach), [Falmouth (Cocks)]; and Cullercoats, Northumberland (Norman). Abroad it has been got by D'Orbigny in the harbour of Brest, [by Aucapitaine and others in the west of France,] and on the Swedish coast by Professor Lovén.

This very curious mollusk appears at first sight rather unattractive; but on nearer inspection the brilliant gem-like spots give it a very elegant and peculiar appearance.

Genus II. TRI'OPA *, Johnston.

Body limaciform, subdepressed: *mantle* small, extended over the head in front, and surrounded with linear or subclavate marginal appendages: *dorsal tentacles* laminated, retractile within small sheaths: *oral tentacles* cylindrical: *gills* plumose, non-retractile: *odontophore* rather broad, with numerous lateral plates, two on each side near the centre bearing spines.

Dr. Johnston established this genus for the *Doris clavigera* of Müller. The *D. lacera* of the same author also belongs to it. No other members of the genus are known. It approaches, however, very near to the *Euplocamus* of Philippi, one or two species of which inhabit the Mediterranean.

Triopa cla'viger, Müller.

T. claviger, Johnst. in Ann. N. H. 1st ser. i. p. 124; A. & H. Brit. Nud. Moll. fam. 1, pl. 20.

Body elongated, white: *mantle* small, produced and rounded in front, and ending in a point behind; white, with a few orange or red tubercles on the back, and having the margin surrounded with linear or subclavate processes, the upper portions of which are of a golden yellow frequently approaching to orange, but sometimes paler; those over the head are a little smaller than the others, more closely set, and somewhat papillated; the side ones are smooth and nearly linear or subclavate: *dorsal tentacles* subclavate, thickly laminated, yellow, issuing from very short sheaths with smooth margins: *oral tentacles* cylindrical and truncated, folded into a tube open above: *gills* 3, tripinnate, white, tipped with yellow. L. 0·75.

Habitat: This pretty species is found from low-water mark to the depth of several fathoms, in the littoral and laminarian zones, on nearly all parts of the British coast, but especial on the south and west. It is rather rare on the north-east coast of England; and specimens got in that district are smaller, broader, and more brilliantly coloured than usual.

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* The name of a son of Neptune. [Properly Triopas, a king of Thessaly.]

The gills, too, are less developed. Dr. Johnston first described this variety under the name of *Tergipes pulcher*, which he afterwards changed to *Triopa claviger*, recognizing it as the *Doris clavigera* of Müller. It is the *Euplocamus plumosus* of Mr. Thompson, of Belfast, from the north coast of Ireland. Its range extends to the Scandinavian shores.

Genus III. THECA′CERA [*], Fleming.

Body limaciform, smooth: *mantle* indistinct, occasionally having a frontal veil: *dorsal tentacles* laminated, retractile within variously formed sheaths: *oral tentacles* none: *gills* plumose, non-retractile; they surround the vent in the elevated part of the back, and have lateral appendages: *odontophore* with several lateral plates, two on each side next the centre denticulated: *jaws* small, lateral, and corneous.

Thecacera differs from *Polycera* chiefly in having sheathed tentacles; the head-veil is also less distinct or entirely wanting, and the appendages less numerous. All the species are rare.

1. Thecacera penni′gera, Montagu.

Doris pennigera, Mont. in Linn. Trans. xi. p. 17, pl. 4. f. 5. *T. pennigera*, A. & H. Brit. Nud. Moll. fam. 1, pl. 21 *a*.

Body nearly linear, with the back elevated, and tapering to a point behind, smooth, white, nearly covered with irregular bright orange blotches with numerous velvety-black spots interspersed: *dorsal tentacles* rather stout, the laminated portion yellow, with black spots; they issue from wide sheaths which are open on the inner side, a little elevated in front, and rise into a blunt lobe behind: *head* narrow, without veil: *gills* 3, tripinnate, rather small, white, with black spots and orange blotches; the gills project from a peduncle on the centre of the back; there is a large lobate appendage on each side set considerably behind the gills. L. 0·5.

Habitat: *T. pennigera* appears, as far as we know at present, to be confined to the south coast of England, where it

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[* Having sheathed tentacles.]

was first found by Montagu near low-water mark, at Milton, Devon. It has since been met with on the Cornish coast by Mr. Richard Couch [and Mr. Cocks]; at Weymouth by Mr. Thompson, and in Salcombe Bay by the Rev. T. Hincks. [Brest (Fischer).]

2. T. VIRESCENS, Alder and Hancock.

T. virescens, A. & H. Brit. Nud. Moll. p. 44, and App. p. iii.

BODY rather convex, of a pale peach-blossom tint, blotched with green before and behind: *dorsal tentacles* broadly laminated, green, with small simple sheaths: *head* with a plain margin in front: *gills* 5, green, margined with white; a single row of obtuse tubercles encircles the branchial region. L. 0·3.

HABITAT: Two specimens were found by Mr. Cocks on an oyster-bed at Bar point, Falmouth, in March 1849.

3. T. CAPITA'TA, Alder and Hancock.

T. capitata, A. & H. Brit. Nud. Moll. p. 44, and App. p. iv.

BODY white, freckled with greenish-brown: *mantle* very indistinct, forming a veil over the head and a faint pallial ridge on the sides of the body, disappearing before reaching the gills: the *head-veil* has four or five orange tubercles on each side, and a row of the same between the tentacles: there is also a row of tubercled orange spots on each side of the body below the veil, and a central and two lateral rows of obscure yellowish tubercles reach from the gills to the tail: *dorsal tentacles* with small simple or plain sheaths: *gills* 7, pinnate, tipped with orange: there is a stout branchial lobe on each side, also tipped with orange. L. 0·25.

HABITAT: Dredged in 20 fathoms water off St. Ives, Cornwall, by Mr. Barlee in 1853.

Genus IV. CRIM'ORA*, Alder and Hancock.

BODY limaciform: *mantle* very indistinct, forming a veil with branched appendages over the head, and a pallial ridge on the sides of the back: *dorsal tentacles* laminated, retractile within sheaths: *oral tentacles* tubercular: *gills* plumose, non-retractile; *odontophore* broad, with lateral spines of three kinds; the first next the centre large and bicuspid, the next five or six short and squarish, the remainder very long, curved, and slender.

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* A proper name from Ossian.

This genus agrees with the *Plocamophorus* of Rüppell in having a branched veil in front, but differs in the absence of the fin-like tail. It has also a considerable resemblance to *Thecacera*, in which genus, however, the veil is either absent or imperfectly developed. The tongue differs from that of any other genus of the family.

CRIMORA PAPILLA'TA, Alder and Hancock.

C. papillata, A. & H. in Ann. N. H. 3rd ser. x. p. 263.

BODY ovate-oblong, tapering posteriorly, white, with the processes tipped with yellow: *dorsal tentacles* subclavate, yellow, retractile within short sheaths: *oral tentacles* short, tubercular: *head-veil* bilobed, each lobe furnished with five more or less branched appendages: a slight pallial ridge, bearing numerous yellow filamentous papillæ, runs down each side of the back, terminating in a small bifid process behind; similar small papillæ are dispersed over the body: *gills* 3, tripinnate. L. 0·6.

HABITAT: A single specimen of this interesting Nudibranch was dredged by the Rev. A. M. Norman among *Zosteræ* in shallow water, in Moulin Huet Bay, Guernsey, in 1858; and another specimen was obtained by the same gentleman on again visiting the island in 1865.

** *Dorsal tentacles without sheaths, non-retractile.*

Genus V. POLY'CERA*, Cuvier.

BODY limaciform, smooth or tuberculated: *mantle* indistinct, forming a digitated veil in front, and a tuberculated ridge on each side of the back: *dorsal tentacles* laminated, non-retractile, without sheaths: *oral tentacles* obsolete or indistinct: *gills* plumose, non-retractile, with lateral appendages: *odontophore* rather narrow, with 6 or more plates on each side, the two next the centre large and bicuspid: *jaws* lateral and corneous.

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* Many-horned.

This genus is not numerous in species, most of those known inhabiting the coasts of Europe; one is found in North America, and one in Brazil. It is the *Themisto* of Oken.

1. Polycera quadrilinea'ta, Müller.

Doris quadrilineata, Müll. Zool. Dan. Prod. p. 229; A. & H. Brit. Nud. Moll. fam. 1, pl. 22.

Body nearly linear, tapering behind, smooth, white, occasionally freckled with black, with several rows of yellow or orange tubercles, four of which (two at the margin of the cloak and two at the sides below) are most prominent: *mantle* expanded into a veil in front with four (or sometimes six) stout, linear, pointed filaments, tipped with yellow, and continued into a faint pallial ridge on each side of the back: *dorsal tentacles* subclavate, with the laminated portion yellow: *gills* 7–9, simply pinnate, with a linear lateral appendage on each side: all the processes are tipped with yellow or orange. L. 0·75.

Var. *a*. With 4 black bands uniting the principal rows of yellow tubercles.

Var. *b*. With alternate stripes of black and scarlet-orange covering the whole of the body.

Habitat: On small seaweeds in rock-pools, between tide-marks and in shallow water on all parts of the British coast; not uncommon. Variety *b* was found in Salcombe Bay (Alder). The species ranges from Norway to the Mediterranean. The variety *a* is that originally described and figured by Müller under the name of *Doris quadrilineata*, and perhaps ought to be considered the type of the species; but it is less common than the bandless form, to which Abildgaard subsequently gave the name of *D. cornuta*, supposing it to be a distinct species. They are, however, undoubtedly the same.

This beautiful species is rather lively in its habits, and is fond of swimming on the surface of the water in the usual inverted position. It is the *Doris flava* of Montagu, *Polycera ornata* of D'Orbigny, *P. lineata* of Risso, and *P. typica* of Thompson.

2. P. OCELLA'TA, Alder and Hancock.

P. ocellata, A. & H. in Ann. N. H. 1st ser. ix. p. 33; and Brit. Nud. Moll. fam. 1, pl. 23.

Body rather stout, greenish-black, with large tubercular whitish spots: *mantle* with a whitish free margin, tuberculated or scalloped, forming a bilobed veil, interrupted in front, and continued along the sides of the back to the branchial appendages, which are lobated and slightly branched: *dorsal tentacles* rather long, conical, broad and smooth below; the laminated portion rather short, greenish, tinged with reddish-brown: *head* semicircular: *gills* 5, bipinnate, greenish-white tinged with brown. L. 0·5.

Habitat: Under stones in pools between tide-marks; pretty generally distributed, but not common. [Kiel Bay, Little Belt, Samsoe, and Heligoland (Meyer and Möbius.)]

3. P. Lesso'ni, D'Orbigny.

P. Lessonii, D'Orb. in Mag. de Zool. vii. p. 5, pl. 105; A. & H. Brit. Nud. Moll. fam. 1, pl. 24.

Body stout, green or yellowish, with yellow tubercles: *mantle* with a narrow free margin, set with strong yellow tubercles, and forming a bilobed veil, interrupted in front, and continued along the sides of the back to the lobated and clustered branchial appendages: *dorsal tentacles* short, clavate, and laminated for two-thirds of their length: *head* angulated: *gills* 3, bipinnate. L. 0·5.

Habitat: In deepish water in the coralline zone; generally found feeding upon *Gemellaria loricata*. More local than the last. Cullercoats, not uncommon; Dublin Bay, rare (Alder); mouth of the Dee, Cheshire (Byerley). [Moray Firth (Gordon).]

P. Lessoni was first found on the French coast by D'Orbigny, and has been got in Sweden by Professor Lovén. The *Doris illuminata* of Gould's 'Invertebrata of Massachusetts' is also probably this species. It is the *P. modesta* of Lovén; and the young is the *P. citrina* of Alder.

Genus VI. AN'CULA [*], Lovén.
[Pl. III. f. 3.]

Body limaciform, smooth: *mantle* indistinct or obsolete, represented by a row of filaments on each side of the *gills* on the middle of the back: *dorsal tentacles* laminated, non-retractile, with styliform basal appendages: *oral tentacles* consisting of two tubercular processes on the sides of the head: *odontophore* narrow, with four spines in each transverse row: there is a spinous buccal collar.

Ancula differs from *Polycera* in having basal filaments on the tentacles, as well as in the absence of a veil and mantle or dorsal area. The same characters serve to distinguish it from *Idalia*. It is founded on a single species.

Ancula crista'ta, Alder.

Polycera cristata, Alder in Ann. N. H. 1st ser. vi. p. 340, pl. 9. f. 10–12.
A. cristata, A. & H. Brit. Nud. Moll. fam. 1, pl. 25.

Body nearly linear, a little swollen in the centre, and terminating in a slender tail; white, with the processes tipped with golden-yellow or orange: *dorsal tentacles* long, clavate, and broadly laminated, the basal portion of each bearing two styliform appendages: *oral tentacles* small, tubercular: *gills* or branchial plumes 3, tripinnate, on each side of which is a row of 5 linear appendages, tipped with yellow or orange. L. 0·5.

Habitat: This elegant species is found within tide-marks and in shallow water on nearly all parts of the British coast. In Ireland the only locality recorded is near Dublin (Alder); but it will probably be found more common in that country

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[* A ministering goddess.]

also when properly looked for. Its range extends northward to Norway and Sweden. [Heligoland (Frey and Leuckart); Kiel Bay (Meyer and Möbius).]

Genus VII. IDA'LIA*, Leuckart.

Body ovate, thick, rather convex, with a small indistinct mantle occupying an elevated dorsal area, and margined with filaments, which are longest in front of the tentacles: *dorsal tentacles* linear, laminated, non-retractile, without sheaths: *head* broad, produced in front, without oral tentacles: *gills* simply pinnate, non-retractile: *foot* large: *odontophore* narrow, with four spines in each transverse row: there is a spinous buccal collar.

The aspect of *Idalia* is rather heavy and massive compared with other members of the family; but it is generally attractive on account of the beauty and variety of its colours, the prevailing one of which is red. Members of the genus are found throughout most of the European Seas.

A. *Centre of the back furnished with filaments.*

1. Idalia e'legans, Leuckart.

I. elegans, Leuck. Brev. An. Desc. p. 15, f. 2; A. & H. Brit. Nud. Moll. fam. 1, pl. 27. f. 1–4.

Body ovate, a good deal elevated on the back, white, thickly freckled with rosecolour, the processes of a brilliant orange-yellow: *mantle* small, the margin with two long filaments in front of the tentacles; filaments round the sides numerous and rather short, the posterior ones on each side obtusely lobated; dorsal filaments five, three down the centre and one on each side in front of the gills; they are all bright orange with yellow tips: *dorsal tentacles* long, linear, finely laminated behind for about two-thirds down, rosecoloured, with a central pale band and yellow tips: *head* broad, sloping downwards from the tentacles: *gills* or branchial plumes 18, raised on a stout peduncular base, diminishing posteriorly, rosecoloured, tipped with yellow: *foot* large, having an undulating margin, bordered with orange-yellow. L. 1·5.

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* A name of Venus. [Properly Idalie.]

HABITAT: Two specimens were dredged in 15 f., near Castle Cornet, Guernsey (Alder). Mr. Barlee also met with it in Birterbuy Bay, Connemara. [Devon and Cornwall (Spence Bate).] It inhabits the Mediterranean, where it was first met with by Leuckart. It is the *I. laciniosa* of Philippi.

This brilliant and very beautiful Nudibranch has the curious habit of taking up its abode in the test of an Ascidian. Both the individuals dredged in Guernsey were so located.

2. I. LEA'CHII, Alder and Hancock.

I. Leachii, A. & H. Brit. Nud. Moll. fam. 1, pl. 27. f. 5.

BODY elevated, white: *mantle* small, with four very long and stout filaments in front of the tentacles, and seven others (also rather long) on each side of the pallial margin, the last bifid; the dorsal area contains from three to five rows of filaments of two to four each: *dorsal tentacles* long, rather stout and tapering, finely laminated behind nearly to the base: *gills* 11, set on an elevated part of the back, diminishing posteriorly: *foot* broad and fleshy. L. 1.

HABITAT: In rather deepish water. Torbay (Mrs. Griffiths): Whitburn, Durham (Abbes); the Hebrides, and Birterbuy Bay (Barlee). [Shetland (Norman).]

B. *Centre of the back without filaments.*

3. I. ASPERSA, Alder and Hancock.

I. aspersa, A. & H. Brit. Nud. Moll. fam. 1, pl. 26, and App. p. iv.

BODY ovate, reddish or yellowish, freckled with orange and reddish-brown: *mantle* inconspicuous, forming a rather narrow dorsal area, with four very large and stout filaments in front (two at the base of each tentacle); lateral filaments short, two or three on each side near the gills: *dorsal tentacles* long and tapering, finely laminated behind nearly to their base: *gills* 10, short, equal in length, forming a circle: *foot* broad. L. 0·5.

Habitat: In deepish water, Cullercoats (Alder); Bray, Ireland (Ball); Birterbuy Bay, not uncommon (Barlee). [W. Sweden (Lovén).]

4. I. inæqua'lis, Forbes.

I. inæqualis, F. & H. iii. p. 579, pl. YY. f. 4; A. & H. Brit. Nud. Moll. p. 46, and App. p. v.

Body grey, speckled with yellow and brown: *mantle* inconspicuous, with four unequal filaments in front, the exterior ones longest; lateral filaments short, four or five on each side near the gills: *dorsal tentacles* linear, stout: *gills* 9 (the anterior one bifid), slender, diminishing posteriorly. L. 0·6.

Habitat: Dredged by Forbes and others on the eastern and western coasts of Shetland, in 35–80 f. It comes very near to the last.

5. I. pulchella, Alder and Hancock.

I. pulchella, A. & H. Brit. Nud. Moll. p. 19, and App. p. v.

Body ovate, freckled with pale lilac: *mantle* small, produced in front, with four filaments set on an expanded pallial or velar ridge; lateral filaments five or six on each side, the last large and bifid: *dorsal tentacles* clavate, laminated for three-fourths their length: *gills* 11 (the anterior one bifid), rather small, diminishing posteriorly. L. 0·4.

Habitat: A single specimen was dredged by Mr. Barlee at St. Ives, Cornwall, in 1853. [W. Sweden (Lovén).]

6. I. quadricornis, Montagu.

Doris quadricornis, Mont. in Linn. Trans. xi. p. 17, pl. 4. f. 4. *I. quadricornis*, A. & H. Brit. Nud. Moll. p. 46, and App. p. v.

Body ovate, depressed, mottled with brown and white: *mantle* indistinct, with two long filaments in front (one at the base of each tentacle); lateral filaments small, tubercular: *dorsal tentacles* very long, linear: *gills* 8 or 9, small. L. 0·4.

Habitat: South coast of England; rare (Montagu).

This species is only known through Montagu's description and figure.

Genus VIII. GONIODO'RIS [*], Forbes.

Body elongate or squarish: *mantle* rather small and short, having a waved or scalloped margin, without appendages, exposing the head and foot: *dorsal tentacles* laminated, non-retractile: *oral tentacles* flattened and angular: *gills* plumose, surrounding the vent on the medio-dorsal line, non-retractile: *odontophore* narrow: there is a spinous buccal collar.

This genus, as now restricted, contains very few species; the two here described are the only ones known as European. Two others have been found in the Indian Seas.

1. Goniodoris nodo'sa, Montagu.

Doris nodosa, Mont. in Linn. Trans. ix. p. 107, pl. 7. f. 2. *G. nodosa*, A. & H. Brit. Nud. Moll. fam. 1, pl. 18.

Body limaciform, subangulated, tapering a little posteriorly, transparent white, tinged with yellow or pink, with opaque-white spots: *mantle* with a scalloped margin, reflected upwards, and a keel down the back, on each side of which are one or two rows of prominent tubercles: *dorsal tentacles* clavate, yellowish: *oral tentacles* flattened, and produced into blunt points: *gills* 13, simply pinnate, non-retractile. L. 1.

Habitat: Not uncommon between tide-marks on most of our rocky shores, especially in the months of May and June, at which time it is spawning. Professor Lovén records it as Swedish; but we have no account of it as yet from other foreign localities, though it will probably be found on the neighbouring coasts of France and Holland. The species is rather variable. Varieties of it have been named *Doris Barvicensis* by Johnston, *G. emarginata* by Forbes, and *G. elongata* by Thompson.

[* An angulated *Doris*.]

2. G. CASTA'NEA, Alder and Hancock.

G. castanea, A. & H. in Ann. N. H. 1st ser. xvi. p. 314; and Brit. Nud. Moll. fam. 1, pl. 19.

BODY ovate, tapering obtusely behind, reddish-brown spotted with white, the sides strongly tuberculated: *mantle* very small, somewhat tuberculated, with a waved and reflected margin, and a strong pale ridge down the centre: *dorsal tentacles* stout, broadly laminated: *oral tentacles* broad, flat, and angulated, each terminating in a rather pointed apex: *gills* 6 or 7, tripinnate, large and spreading, rather darker-coloured than the body: *foot* large and broad. L. 1.

HABITAT: Under stones near low-water mark; rare. Salcombe Bay (Alder); Falmouth (Cocks); Saltcoats, Ayrshire (D. Landsborough, jun.).

The *Doris Paretii* of Verany, found by him [at Nice] near Genoa, is synonymous with this species [?]. Mediterranean specimens are of larger size, reaching nearly an inch and a half in length.

Family II. DORI'DIDÆ.

Mantle large, spiculose, entire, without marginal appendages: *dorsal tentacles* retractile within cavities: *mouth* with a denticulated prehensile tongue or odontophore.

Genus DORIS [*], Linné.

[Pl. III. f. 4.]

BODY ovate or elliptical, generally more or less depressed: *mantle* covering the head and foot: *dorsal tentacles* clavate or conical, laminated, and retractile within cavities, sometimes slightly sheathed: *oral tentacles* variable, sometimes replaced by a veil: *gills* plumose, placed posteriorly on the median line of the mantle and partially or completely surrounding the vent.

The genus *Doris* is very generally diffused over the globe, and contains numerous species; those of tropical climates grow to a large size, and are often of very brilliant colours. The British species comprise three sections.

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[*] [Daughter of Oceanus and wife of Nereus.]

A. *Gills united at the base and retractile within a cavity: odontophore broad, with numerous spines.* (Doris *proper.*)

1. Doris tubercula'ta, Cuvier.

D. tuberculata, Cuv. in Ann. du Mus. v. p. 469, pl. 74. f. 21; A. & H. Brit. Nud. Moll. fam. 1, pl. 3.

Body elliptical, subdepressed, orange or yellow, sometimes nearly white, usually blotched with brown or olive: *mantle* thickly covered with moderate-sized, unequal, flattish tubercles: *dorsal tentacles* conical: *oral tentacles* tubercular: *gills* or branchial plumes 9, tripinnate, recurved, large and spreading, forming a circle slightly open behind, transparent white, tipped with violet. L. 2–3.

Habitat: Under stones and in crevices of rocks within tide-marks; common on all parts of the British coast. Its range of depth does not extend much beyond low-water mark.

This is the largest of our British *Dorides*: specimens have been found reaching 4, or sometimes 5, inches in length; but these are extremely rare. It is a very sluggish animal. [Sometimes used in Shetland as a bait for rock-cod. The fishermen there call it "peer."] The spawn may often be seen in rock-pools in the spring and early summer, forming a conspicuous convoluted cup, of a buffcolour, with slightly waved margins.

D. tuberculata is found on the northern and western coasts of France, and is recorded as occurring on the Swedish and Norwegian coasts as well as in the Mediterranean; but as more than one species have been described under this name by continental authors, the latter habitat at least requires confirmation. [Heligoland (Frey and Leuckart).]

This is the *D. argo* of Pennant, Fleming, and several of our earlier writers. The true *D. argo* is a Mediterranean species.

2. D. flam'mea, Alder and Hancock.

D. flammea, A. & H. in Ann. N. H. xiv. p. 330; and Brit. Nud. Moll. fam. 1, pl. 4.

Body ovate or elliptical, scarlet, rarely with slight blotches of purple: *mantle* covered with rather small, unequal, flattish tubercles: *dorsal tentacles* conical: *oral tentacles* tubercular: *gills* 9, tripinnate, not spreading, of a scarlet colour, rather paler than the body. L. 1.

HABITAT: On the shells of *Pecten opercularis* and on stones in shallow water in Lamlash and Rothesay Bays; rather rare. [Falmouth (Cocks); Clyde district (Landsborough and Norman).]

This appears to be the scarlet *Doris* dredged by Professor E. Forbes in the Isle of Man (Ann. N. H. 1st ser. v. p. 102), and referred by him to *D. argo.*

3. D. ZETLANDICA, Alder and Hancock.

D. Zetlandica, A. & H. Brit. Nud. Moll. p. 42, and App. p. i.

BODY oval, white or yellowish: *mantle* with rather large, conical, pointed tubercles: *dorsal tentacles* linear, finely laminated: *oral tentacles* tubercular: *gills* 6, bipinnate. L. 0·75.

HABITAT: Inner haaf, near Lerwick, Shetland; very rare. A specimen was obtained in that locality by Mr. Barlee in 1849; and another has since been got off the Whalsey Skerries on the same coast, in 40 f., by the Rev. A. M. Norman.

The most striking peculiarity in this species is in the spines of the tongue, which differ from those of any other known *Doris*; they are very long, slender, subclavate, and denticulated on the inner margin.

4. D. MILLEGRA'NA, Alder and Hancock.

D. millegrana, A. & H. Brit. Nud. Moll. p. 42, and App. p. i.

BODY oval, depressed, yellow or orange: *mantle* large, covered with minute, close-set, granular tubercles: *dorsal tentacles* conical: *oral tentacles* linear: *gills* 6, bipinnate. L. 1·25.

HABITAT: Torbay. The only evidence we have of this species consists of two specimens in Dr. Leach's collection at the

British Museum, sent from Torbay by Mrs. Griffiths. The species comes nearest to *D. Johnstoni*, but is sufficiently distinguished from it by the form of the tubercles, and by the number and character of the branchial plumes, which lie over on the back and are interrupted behind, while those of *D. Johnstoni* form a complete erect circle.

5. D. TESTUDINA′RIA, Risso.

D. testudinaria, Risso, Hist. Nat. de l'Eur. Mér. iv. p. 33, f. 15. *D. planata*, A. & H. Brit. Nud. Moll. fam. 1, pl. 8. (young).

BODY ovate, or broadly elliptical, rather flat: *mantle* large, expanded, variegated with chestnut-brown and pale yellow, and covered with very unequal, soft, warty tubercles; underside lemoncoloured, spotted with brown: *dorsal tentacles* clavate, stout, yellowish: *oral tentacles* linear: *gills* 8, tripinnate, mottled with brown and white, forming an incomplete circle behind, and retractile within a large cavity. L. 2.

HABITAT: Within tide-marks, Isle of Herm (G. S. Brady and Hodge); in shallow water, Lamlash Bay (Alder); and near Cumbrae, Firth of Clyde (Robertson). [Falmouth (Cocks); Nice (Risso and Verany); Adriatic (Grube); Ægean (Forbes).]

The examination of further specimens of different sizes from the Clyde district proves that *D. planata*, of the 'British Nudibranchiate Mollusca,' is the young of *D. testudinaria*. In its young state it is extremely flat, and the gills imperfectly developed.

6. D. JOHNSTO′NI, Alder and Hancock.

D. obvelata, Johnst. in Ann. N. H. 1st ser. i. p. 52 (non Müller). *D. Johnstoni*, A. & H. Brit. Nud. Moll. fam. 1, pl. 5.

BODY ovate-oblong, yellowish-white or yellow, sometimes approaching to orange, with a few minute brown spots: *mantle* covered with minute, close-set, pilose tubercles: *dorsal tentacles* clavate, rather short and stout, brownish, with the margin of the cavities a little raised and serrated: *oral tentacles* linear: *gills* 15, tripinnate, forming a complete cup. L. 1·75.

Habitat: On rocky shores and in shallow water, on nearly all parts of the English and Scottish coasts, but nowhere common. Skerries near Dublin (Hyndman). We have no account of its occurrence out of Britain; but it will probably be found on the neighbouring shores of the continent. [Norway (M'Andrew and Barrett); Sweden (Lovén).]

7. D. cocci'nea (Forbes), Alder and Hancock.

D. coccinea, Forb. Rep. Ægean Invert. B. A. 1843?; A. & H. Brit. Nud. Moll. fam. 1, pl. 7.

Body elliptical, bright scarlet, with a few minute black spots: *mantle* closely covered with minute pilose tubercles: *dorsal tentacles* short, clavate, with the laminæ open in front, yellowish, spotted with red; a row of largish yellow tubercles surrounds the base of each: *oral tentacles* linear: *gills* 10, small, simply pinnate, erect, pointed, forming a circle. L. 0·5.

Habitat: Under stones between tide-marks, on the coasts of Cornwall and Devon; rather rare. [Faroe (Mörch); Brittany (Taslé); Rochelle (Fischer).]

This pretty species was first found on the Devonshire coast by Montagu, who named it *D. coccinea* in manuscript, as we are informed by Dr. Leach. Professor E. Forbes considered it to be identical with the *Doris* so named by him (but not described) in his Ægean Report. Of this, however, there may be some doubt. The species comes very near to *D. Johnstoni*, but differs from it essentially in the form and number of the branchial plumes. The armature of the tongue, too, is very distinct in the two species.

8. D. repanda, Alder and Hancock.

D. repanda, A. & H. in Ann. N. H. 1st ser. ix. p. 32; and Brit. Nud. Moll. fam. 1, pl. 6.

Body ovate-oblong, depressed, waxy-white: *mantle* large, spreading, with small, rather distant, soft tubercles; a row of sulphur-yellow or opaque-white spots runs down each side;

underside of the mantle veined: *dorsal tentacles* clavate, white or yellowish, finely laminated: *oral tentacles* flattened and broadly angulated: *gills* 5, small, tripinnate. L. 1.

HABITAT: Not uncommon among the rocks between tide-marks, on the north-east coasts of England and Scotland; also found in Shetland and on the west coast of Scotland; but it does not appear to extend to the south of England. [Falmouth (Cocks).] Roundstone, Connemara (W. Thompson). It is found on the Swedish and Norwegian coasts, and is considered by Professor Lovén to be the *D. obvelata* of Müller. It is the *D. lævis* of Fleming. [Calvados, France (Fischer).]

B. *Gills simply pinnate, non-retractile: no oral tentacles, their place being supplied by a veil: odontophore narrow, with few spines.* (Lamellidoris, *A. & H.*)

9. D. AS′PERA, Alder and Hancock.

D. aspera, A. & H. in Ann. N. H. 1st ser. ix. p. 32; and Brit. Nud. Moll. fam. 1, pl. 9. f. 1–9.

BODY elliptical, semitransparent, white, sometimes with a tinge of yellow: *mantle* with stout, flattish, clavate tubercles: *dorsal tentacles* subconical, laminated on the upper half: *head-veil* rather broad, but not much produced: *gills* 11, small, erect: *liver* of a pinkish hue, apparent through the skin. L. 0·3.

HABITAT: Under stones between tide-marks, on the north-eastern coasts of England and Scotland, not uncommon; less common on the western coast of Scotland. Malahide, near Dublin (Alder). [W. Sweden (Lovén).]

D. aspera is rather more active than most of its congeners. When kept in a vase it is apt to creep out of the water and die upon the sides of the vessel for want of moisture. This habit is common to several of the littoral *Dorides*.

10. D. PROX'IMA, Alder and Hancock.

D. proxima, A. & H. Brit. Nud. Moll. fam. 1, pl. 9. f. 10–16.

BODY elliptical, orange-yellow: *mantle* with stout, conical tubercles: *dorsal tentacles* linear or subclavate, laminated nearly throughout: *head-veil* rather large, semicircular: *gills* 11, not quite closely surrounding the vent: *liver* large, appearing through the skin of a purplish-brown colour. L. 0·5.

HABITAT: Among rocks and seaweeds at Birkenhead, where it was found by Mr. Price; but it has been now nearly extirpated by the alterations on that shore. Mersey and Dee (Collingwood). It has not yet been found in any other locality. [Bornholm Isle, in the Baltic (Meyer and Möbius).]

D. proxima may be best distinguished from *D. aspera* by the conical form of the tubercles. A good anatomical distinction is found in the tongue, which has 11 lateral plates on each side: in *D. aspera* there are only 3; a satisfactory character, confirming the small differences in the external form.

11. D. MURICA'TA, Müller.

D. muricata, Müll. Zool. Dan. iii. p. 7, pl. 85. f. 2–4; A. & H. Brit. Nud. Moll. p. 42, and App. p. iii.

BODY oval or roundish, yellowish-white: *mantle* with rather large, close-set, rounded or clavate tubercles: *gills*? L. 0·3.

HABITAT: Belfast and Strangford Lough. The only knowledge we have of this as a British species we owe to Mr. Wm. Thompson, of Belfast, who took it in the above localities. [Scandinavian coasts (Müller and others); Faroe Isles (Mörch).]

12. D. LOVE'NI, Alder and Hancock.

D. muricata, Lovén, Index Moll. Scand. p. 5. no. 18. *D. Lovéni*, A. & H. in Ann. N. H. 3rd ser. x. p. 262.

BODY ovate, rather convex, yellowish-white: *mantle* with very large, rather distant, clavate tubercles, interspersed with smaller ones: *dorsal tentacles* robust, yellowish: *head-veil* large, undulating: *gills* 11, set in a small incomplete circle or ellipse. L. 0·5.

Habitat: Among stones between tide-marks, Bantry Bay, where a single specimen was found by Mr. Norman in 1858. It occurs on the coasts of Norway and Sweden.

13. D. Ulidia'na, Thompson.

D. Ulidiana, Thomps. in Ann. N. H. 1st ser. xv. p. 312; A. & H. Brit. Nud. Moll. p. 42, and App. p. ii.

Body oblong, pale yellow: *mantle* with rather large, unequal, depressed tubercles: *dorsal tentacles* long, slender, whitish: *head-veil* large, semicircular: *gills* 11, beautifully white, set in a semicircle: *liver* appearing of a dark colour through the skin. L. 0·5.

Habitat: Three individuals of this species were obtained by the late Mr. W. Thompson, of Belfast, on oysters brought to Belfast Market from the coast of Down or Antrim. It does not appear to have been since met with.

14. D. dia'phana, Alder and Hancock.

D. diaphana, A. & H. in Ann. N. H. 1st ser. xvi. p. 313; and Brit. Nud. Moll. fam. 1, pl. 10.

Body elliptical, very transparent, white: *mantle* with equal, rather distant, clavate tubercles: *dorsal tentacles* linear, stout, yellowish: *head-veil* undulating: *gills* 11, stout, yellowish, set in an open incomplete circle: *liver* extending much forward and appearing very large and black through the foot. L. 0·5.

Habitat: Meadfoot sands, Torbay, where two specimens were obtained in 1845 (Alder). [Falmouth (Cocks).]

The last six species approach each other very closely, and can only be distinguished by critical examination.

15. D. OBLONGA, Alder and Hancock.

D. oblonga, A. & H. in Ann. N. H. 1st ser. xvi. p. 314; and Brit. Nud. Moll. fam. 1, pl. 16. f. 4, 5.

BODY oblong, tapering behind: *mantle* yellowish, with brown spots, covered with stout conical tubercles: *dorsal tentacles* subclavate, stout, with short sheaths: *head-veil* semicircular, produced in front: *gills* 7, rather large and close-set, surrounded by a circle of tubercles. L. 0·5.

HABITAT: A single specimen dredged off Berry Head (Alder).

16. D. BILAMELLA'TA, Linné.

D. bilamellata, Linn. S. N. p. 1083; A. & H. Brit. Nud. Moll. fam. 1, pl. 11.

BODY elliptical: *mantle* dull white, mottled and blotched with brown in a longitudinal direction, forming a faint band down the centre of the back, and two brighter but much interrupted bands down the sides; covered with large, unequal, clavate tubercles: *dorsal tentacles* linear, brownish: *head-veil* broad, undulating: *gills* 20–29, small, brown, placed at a little distance round the vent in a transversely elliptical or horseshoe form, with the posterior ends curved inwards. L. 0·5–1·5.

HABITAT: This is one of the most common of our British *Dorides*, often appearing in considerable numbers on the rocky parts of the coast, especially in the north. Most plentiful in the early spring, at which time they are spawning. Two varieties occur, one so much larger than the other as to have been frequently considered a distinct species. The smaller variety is *D. vulgaris* of Leach, and the larger *D. Elfortiana* and *D. Leachii* of De Blainville; this latter variety is also the *D. affinis* of Thompson. *D. bilamellata* is the *D. verrucosa* of Pennant and Fleming, but not of Linné or Cuvier. It is the *D. liturata* of Möller, and *D. obvelata* of Bouchard-Chantereaux. The range of this species appears to extend from the English Channel to Greenland.

17. D. DEPRESSA, Alder and Hancock.

D. depressa, A. & H. in Ann. N. H. 1st ser. ix. p. 32; and Brit. Nud. Moll. fam. 1, pl. 12. f. 1–8.

BODY broadly oval, very much depressed: *mantle* pale sandy-coloured, spotted with reddish-brown, and set with rather long, linear, pointed papillæ; it is transparent, showing the large imbedded spicula arranged transversely across the back and diagonally at the sides: *dorsal tentacles* linear, rather tapering, closely laminated: *head-veil* semicircular: *gills* 11, very small, set in an open circle. L. 0·3.

HABITAT: Under stones between tide-marks and in shallow water; rare, but pretty generally diffused on the British coast. Whitley and Cullercoats, Northumberland (A. Hancock); Scarborough and Torbay (Alder); mouth of the Dee (Byerley). [Mersey (Collingwood).] Burghead (Murray). [Falmouth (Cocks); Brittany (Taslé); Rochelle (Fischer).]

From the transparency of the mantle, the eyes in *D. depressa* are visible behind the dorsal tentacles. In most other species of *Doris* they can only be seen in very young individuals, being afterwards obscured by the thickening of the skin, so as to be scarcely available for the purpose of sight.

The spawn in this and the following two species is deposited in a thin spiral thread of many coils, like that of some of the *Eolides*.

[It is the *Villersia scutigera* of D'Orbigny, according to Fischer.]

18. D. INCONSPI′CUA, Alder and Hancock.

D. inconspicua, A. & H. Brit. Nud. Moll. fam. 1, pl. 12. f. 9–16.

BODY elliptical, rather depressed: *mantle* white, with a shade of purple, slightly sprinkled with minute brown spots, and set with small, blunt tubercles: *dorsal tentacles* subclavate, stout, closely laminated: *head-veil* rather broad: *gills* 10, dull white, stout, set in an open circle. L. 0·3.

HABITAT: Two specimens of this little *Doris* were got by

Mr. Howse upon *Cellepora pumicosa*, from the deep-water fishing-boats, Northumberland. [Arcachon (Fischer).]

19. D. PUSILLA, Alder and Hancock.

D. pusilla, A. & H. in Ann. N. H. 1st ser. xvi. p. 313; and Brit. Nud. Moll. fam. 1, pl. 13.

BODY broadly ovate, depressed: *mantle* fulvous, thickly covered with dark-brown spots and numerous conical tubercles: *dorsal tentacles* slender, tapering, white, with strong distant laminæ: *head-veil* undulating, slightly bilobed: *gills* 9, snow-white, stout and obtuse, set in a rather open circle. L. 0·3.

HABITAT: Under stones at extreme low-water mark in the "Gentlemen's Cove," Torquay, rare (Alder); Burghead (Murray). [Falmouth (Cocks).]

20. D. SPARSA, Alder and Hancock.

D. sparsa, A. & H. in Ann. N. H. 1st ser. xviii. p. 294; and Brit. Nud. Moll. fam. 1, pl. 14.

BODY oval, yellowish-white, depressed: *mantle* spotted with fulvous-brown, and with distant, roundish, obtuse tubercles: *dorsal tentacles* tapering, white, blotched with brown, thinly laminated, and with three or four large tubercles surrounding the base of each: *head-veil* broad, arched: *gills* 9, small, dull white, set in a rather open circle. L. 0·25.

HABITAT: On *Cellepora pumicosa* from the fishing-boats, Cullercoats (A. Hancock).

A single specimen only of this rare species was obtained. In form and markings it comes near to *D. depressa*; but it is at once distinguished from it by the character of the tubercles. In the latter respect it comes nearer to *D. inconspicua*, from which it differs in the shape and less numerous laminæ of the tentacles, and in the large tubercles at their base, as well as in the colour and markings of the cloak. [Faroe (Mörch).]

C. *Gills united at the base, non-retractile: body convex: oral tentacles indistinct, united into a veil: odontophore narrow.* (Acanthodoris, *Gray.*)

21. D. PILO'SA, Müller.

D. pilosa, Müll. Zool. Dan. iii. p. 85, f. 5–8; A. & H. Brit. Nud. Moll. fam. 1, pl. 15.

BODY ovate, very convex, subpellucid; colour various, white, yellow, brown, freckled or blackish: *mantle* with slender pointed papillæ: *dorsal tentacles* long, slightly bent backwards, retractile within small denticulated sheaths: *oral tentacles* indistinct, expanded into a veil at the sides: *gills* 7–9, large and spreading, transparent white or greyish, generally with opaque-white midribs, which form a star in the centre. L. 0·5–1·25.

HABITAT: Within tide-marks or in shallow water; common on nearly all parts of the British coast. It occurs on the northern and western shores of France, as well as in Holland, [Denmark,] Sweden, and Norway. [Faroe (Mörch); Ægean, 13 f. (Forbes).]

Doris pilosa is extremely variable both in size and colour; in consequence of which several species have been made out of it. The small white and blackish varieties are most common within tide-marks. The fine large white and canary-yellow varieties are more local, and inhabit rather deeper water in the laminarian zone; but they are generally abundant where they occur. The black variety is the *D. nigra* of Fleming and *D. Flemingii* of Forbes. Other synonyms for this species are *D. stellata*, Gmelin; *D. sublœvis*, Thompson; *D. fusca*, Lovén; and *D. rosinela*, Leach.

22. D. QUADRANGULA'TA, Alder and Hancock.

D. quadrangulata, A. & H. in Ann. N. H. 1st ser. xvi. p. 313; and Brit. Nud. Moll. fam. 1, pl. 16. f. 1–3.

BODY white, subpellucid, rather elevated: *mantle* small, subquadrangular, scarcely covering the head and foot, set with small conical papillæ: *dorsal tentacles* subclavate, stout, with smooth, slightly elevated sheaths: *head-veil* broad, undulating: *gills* 7, large, spreading transversely: *foot* large and thick. L. 1.

Habitat: A single specimen was dredged near Berry Head in 1845 (Alder); and another has since been got at Hilbro Island, mouth of the Dee, Cheshire, by Mr. Byerley.

Order VI. PULMONOBRANCHIATA, Sowerby.

(See Vol. I. p. 76, and Vol. III. p. 200.)

Bibliopolical reasons caused an interruption of the natural classification or arrangement of the British Mollusca in the present work. The students of land and freshwater shells are so numerous compared with those who collect marine shells, owing chiefly to the want of opportunities, that the publisher considered it expedient to divide the subject and have separate volumes for each branch. But it is evident that this is an artificial barrier, and that the Mollusca ought to be studied without regard to the nature of their habitat.

The air-breathing Mollusca which inhabit the sea-shore and tidal estuaries are few in number. They may be called amphibious, inasmuch as they live partly in water and partly on land. None have been discovered in latitudes more northern than our own.

Family I. ONCIDI'IDÆ, (*Onchidiidæ*)

H. & A. Adams.

Body slug-like, coriaceous: *tentacles* 2, conical or cylindrical: *eyes* placed near the extremities or tips of the tentacles:

foot much narrower than the mantle: *respiratory orifice* under the hinder edge of the mantle: *vent* near the respiratory orifice. Hermaphrodite, with mutual congression, the reproductive organs being separate.

SHELL none.

Genus ONCI'DIUM*, (*Onchidium*) Buchanan.
Pl. III. f. 5.

BODY oblong, convex, usually tuberculous: *head* covered by the mantle when the animal contracts itself; it is furnished with a veil, which is formed of two triangular and compressed lobes: *mouth* destitute of jaws: *gizzard* muscular.

Established by Dr. Buchanan in the 'Transactions of the Linnean Society,' and adopted by Cuvier and Lamarck. The type on which it was founded is a species discovered by Péron on rocks in the Isle of France. Audouin believed that the tubercles on the hinder part of the mantle in the typical species are true gills, which exist independently of the pulmonary apparatus; but other species are quite smooth. It is not improbable, however, that the skin or outer integument of the body may serve the purpose of respiration while the animal remains under water.

It is the genus *Peronia* of De Blainville; at least, no character has been given by him or the Messrs. Adams by which that genus can be distinguished from *Oncidium*.

ONCIDIUM CEL'TICUM†, Cuvier.

Onchidium Celticum, Cuv. Règne An. iii. p. 46, footnote (indicated but not described); F. & H. iv. p. 3, pl. FFF. f. 6.

BODY thick, somewhat extensile, greyish-olive; it is closely but irregularly studded with wart-like tubercles of different sizes, some of which have jagged edges; the underside is closely and minutely tuberculous: *mantle* rather thin, lining the underside, and lying close above the foot; it is greyish-white, and covered with minute white specks: *head* broad, flanked by two large semicircular lobes or lips, which are on a level with the sole of the foot: *mouth* forming a narrow slit in the middle of the underpart of the head, and placed lengthwise: *tentacles* very short and conical, with bulbous tips; they are contractile, as in the *Limnæidæ*: *eyes* bluish-black, nearly on the tips of the tentacles: *foot* rather narrow, squarish in front, and bluntly pointed behind; its action is the same as that of a land-slug, viz. by a series of wave-like movements: *respiratory orifice* circular, at the hinder extremity of the body, between the mantle and the foot: *vent* tubular, placed below the respiratory orifice. L. 0·5. B. 0·375.

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* Diminutive, from ὄγκος, a tumour or swelling.

† Inhabiting the Celtic region.

HABITAT: Crevices of the rocks, a little above high-water mark, apparently feeding on *Lichina pygmæa*, in Lantivet Bay, Cornwall (Couch and Laughrin); Whitsand Bay, near Plymouth (Spence Bate). In the former locality it is associated with *Lasæa rubra*, *Rissoa cingillus* var. *rupestris*, *Melampus bidentatus*, and *Otina otis*. Mr. Laughrin informs me that the *Oncidium* comes out in warm weather and crawls about on the rocks, but that it is seldom seen in the winter; and he adds that they sometimes congregate in groups consisting of as many as twenty individuals. I observed that the *Oncidium*, on being touched or disturbed, rolls up like a *Chiton* by bringing both extremities together. When crawling, the hinder extremity is occasionally notched or hollowed out. They cannot bear long immersion in water. Audouin and Milne-Edwards (Rech. pour servir à l'Hist. Nat. du Litt. de la France) noticed *O. Celticum* as abundant at Port de Solidor, near St. Servan.

Philippi was inclined to consider this identical with a species which he described and figured as *O. nanum*, from

Palermo. He represents the tubercles as whitish, which is not the case in *O. Celticum*; otherwise his description and figure suit our species. His specimens were only 3 millimètres long, and might have been immature.

Family II. ASSIMINE'IDÆ, (*Assiminiidæ*) H. & A. Adams.

Body spiral, enclosed in a turbinated shell: *head* furnished with a broad snout: *tentacles* 2, cylindrical or club-shaped, thick, and contractile: *eyes* placed at or near the tips of the tentacles: *foot* oval: *respiratory orifice* on the right-hand or outer side of the mouth of the shell.

Shell conical and strong: *spire* short: *mouth* roundish-oval, more or less angulated or expanded at the base: *pillar-lip* thick: *inner lip* united to the periphery, but not forming a distinct peristome: *outer lip* sharp: *operculum* horny, pauci-spiral; nucleus on the inner side of the mouth.

Genus ASSIMI'NEA*, Leach. Pl. IV. f. 1.

As this appears to be the only representative of the family (*Paludinella* of L. Pfeiffer and *Optediceros* of Dr. Leith being mere synonyms) it would be superfluous to repeat the description given above.

The careful observations of Mr. Berkeley, in the 5th volume of the 'Zoological Journal,' on the anatomy of *A. Grayana*, left very little doubt of this being a true Pulmonibranch. He could detect nothing like gills, but found that "the vault of the cavity of respiration was traversed by a multitude of minute vessels, all tending one way towards a large vessel running down in the direction of the heart; which is exactly the structure in *pulmoniferous Mollusca*." Neither did Mr.

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* A ridiculous name.

Clark succeed in detecting any branchiæ, although he has given us the number of strands in the gill-plume of *Aclis unica,* which in bulk is only one-tenth of *A. Grayana.* According to Mr. Blanford, Dr. Leith described some species of the present genus, under the name of *Optediceros,* in the 'Journal of the Bombay Branch of the Royal Asiatic Society' for 1853, one of his generic characters being as follows:—"The respiratory opening is a round perforation in the mantle, behind the right tentacle." I have observed the air-pouch of *A. Grayana* and *A. littorina*; in the latter it is very conspicuous and unmistakable. The shell of *A. Grayana* is not unlike that of a young *Limnæa palustris,* especially of its variety *conica*; and as both belong to the same order, and I was not then aware that *Assiminea* has an operculum, my error in following Dr. Fleming, who placed *A. Grayana* in the genus *Limnæa,* was perhaps not so heinous as Dr. Gray made it out to be. Against this criticism of the last-named author may be set off a remark that there is no foundation for his statement that the eyes in *A. Grayana* "are placed on a peduncle as long as the tentacula, and the peduncle and tentacula are soldered together." The eyes are imbedded in the tissue of the tentacles; and there is no peduncle or stalk. The dental apparatus is somewhat complicated, each row consisting of a central tooth flanked on either side by three uncini of different shapes.

This genus bears also Gray's MS. name of *Nerita Syncera,* and has been called *Assiminia* and *Assaminia.* With respect to the present name the author ought to have borne in mind one of Linné's laws of scientific nomenclature, "Idiotæ imposuere nomina absurda." Woodward was clearly mistaken in considering it a subgenus of *Rissoa*. Nor can I agree with Prof. E. von Martens in referring to *Assiminea* the *Melania Charreyi* of Morelet, which seems to me scarcely a variety of *Hydrobia ulvæ*. The *A. gallica* of Dr. Paladilhe is likewise *H. ulvæ,* and will be noticed in the Supplement. It is to be regretted that this writer did not ascertain the genus, as well as that he changed the specific name without any reason.

1. Assiminea Graya'na*, Leach.

Assiminea Grayana, Flem. Brit. An. p. 275. *Assiminia Grayana*, F. & H. iii. p. 70, pl. lxxi. f. 3, 4, and (animal) pl. HH. f. 6.

Body dark grey, with close transverse streaks of a purplish hue: *mantle* open behind: *snout* broad and thick, corrugated or wrinkled across, more or less cloven in front: *mouth* forming a perpendicular slit intersected below by a narrower transverse slit: *tentacles* cylindrical, thick, rather short, divergent; they are not double, nor are any eye-stalks united with them: *eyes* large, black, and lustrous, placed at the extremities or tips of the tentacles: *foot* yellowish-white, or sometimes nearly white, forming a short oval, squarish and broader in front (this part being plain or single-edged), and rounded behind; sole light grey, minutely speckled with white: *respiratory orifice* oblong, large, on the right-hand or outer side of the animal; the pouch is distinctly visible through it, lined with reticulated vascular tissue; there is no gill or branchial plume [*fœces* elliptical, as in *Cyclostoma* (Berkeley)].

Shell forming a short cone, rather solid, when adult nearly opaque, glossy: *sculpture,* slight and indistinct but close-set spiral striæ, the periphery (especially in immature specimens) being more or less angulated: *colour* brownish-yellow, with now and then a broad rufous band encircling the periphery: *spire* bluntly pointed: *whorls* 7, compressed and almost flat, gradually enlarging; the last occupies one-half of the shell: *suture* slight, although well-defined and narrowly excavated: *mouth* representing a short oval, and rather small; its length is two-fifths of that of the whole shell: *outer lip* contracted and somewhat incurved above, expanded and bluntly angular at the base: *inner lip* broad, spread on the pillar, which is thickened, but has no umbilicus or chink: *operculum* thin, distinctly but irregularly striated in the line of growth; spire small, sunken, having two or three obscure whorls. L. 0·2. B. 0·15.

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* Named in honour of the distinguished naturalist Dr. J. E. Gray.

HABITAT: Banks of the Thames, between Greenwich and a little below Gravesend (making altogether a distance of about twenty miles), mostly above ordinary high-water mark; abundant. It appears to take the place of *Hydrobia ulvæ*, which lives in the upper reaches or brackish water of the Thames. Many years ago I noticed in the collection of the late Mr. T. W. Warren, at Dublin, a specimen of *A. Grayana*, which he assured me he had found on the salt-marshes at Portmarnock. Still more doubtful is the only foreign locality, which has been lately given by M. de Malzine, in his 'Essai sur la Faune Malacologique de Belgique,' viz. "La plage, près de la frontière française, rejetée par les vagues." This writer having also enumerated as Belgian *Tellina calcaria*, *T. similis*, *Natica Grœnlandica*, *Velutina plicatilis*, and other shells of a character equally suspicious as regards geographical distribution, I cannot venture to use his catalogue. This little mollusk, which is not only so restricted in its range, but has such a peculiar organization, is tolerably active, and crawls like a *Littorina*. Mr. Jordan compares its movements, which are very graceful, to the gentle pitching of a vessel. I kept one alive upwards of three weeks, and in fresh water more than twelve hours at a time. It evidently prefers air to water. While immersed it adhered firmly by its foot to the side of the glass vessel in which it was confined. On two occasions I observed the respiratory orifice contracted, and a bubble of air expelled from it.

The *Nerita Syncera Hepatica* of Gray, so named but not described in vol. xv. of the 'London Medical Repository.' The reason which he gave for proposing a trinomial system is rather curious, *i. e.* "because I think that it is easier to recollect *limax arion hortensis* than *arion hortensis* alone, as genera are now become so numerous, that naturalists really want something to let them know to what part of natural history they belong." Dr. Gray afterwards published the specific name as *Grayiana*; but that may have been a misprint.

2. A. LITTORI'NA*, Delle Chiaje.

Helix littorina, D. Ch. Mem. An. s. Vert. Nap. iii. p. 215, t. 49. f. 36-38. *Rissoa littorea*, F. & H. iii. p. 132, pl. lxxxi. f. 6, 7, and iv. (App.) p. 265, and (animal) pl. MM. f. 3.

Body white, with a faint tinge of yellow, and of a frosty or reticulated texture: *mantle* rather thick, lining the mouth of the shell: *snout* broad, thin, and wedge-shaped, slightly bilobed or nicked in front: *tentacles* very short, bat-shaped and flattened at the sides: *eyes* comparatively large and black; viewed sideways they seem placed near the tips of the tentacles, but not quite at the extremities; viewed from above they appear terminal: *foot* broadly oval, squarish in front, and rounded behind; it is somewhat constricted in the middle; and when the animal is crawling, it is divided into two parts, each of which advances in turn by a wave-like motion: *respiratory orifice* round and large, on the right-hand side. In one individual which I examined the heart beat with 90 pulsations in a minute; the pulsations were not continuous, but occasionally interrupted.

Shell globosely conical, solid for its size, semitransparent, and glossy: *sculpture*, indistinct and microscopic, close-set, spiral striæ, besides equally minute and numerous lines of growth: *colour* brownish-yellow or amber, sometimes yellowish-white or whitish: *spire* short, and having a very blunt point: *whorls* 4, rather convex, rapidly enlarging; the last occupies three-fourths of the shell; the first is mammillar: *suture* deepish, apparently margined underneath by a darkish line, which represents the periphery of the preceding whorl seen through the semitransparent outer shell: *mouth* shaped as in the last species, but not so small in comparison; its length equals that of one-half of the shell: *outer lip* incurved at the upper corner and expanded below: *inner lip* very broad, and reflected over the pillar, which is thickened and has a small umbilicus behind it: *operculum* rather thin, slightly and closely striated; spire very small and sunken, with two obscure whorls. L. 0·075. B. 0·0625.

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* Derived from *littus* or *litus*, the shore.

Habitat: Under stones and clods of earth among mud, and in caves and rocks

> "Upon the beachèd verge of the salt-flood,"

inside the Chesil Bank at Weymouth, and in the island of Sark; Whitecliff Bay, Isle of Wight (Forbes); Exmouth (Clark); Lands End (Hockin). It lives with *Truncatella truncatula*, *Melampus bidentatus*, *M. myosotis*, var. *ringens*, and *Otina otis*. *A. littorina* is widely distributed throughout the Mediterranean and Adriatic; the Baron de Paiva and Rev. R. B. Watson have found it at Madeira, and Mr. M'Andrew at Teneriffe. Southern specimens are more deeply coloured than ours, but similar in all other respects.

Philippi placed this species in the genus *Truncatella*; and in the plate illustrative of his paper (Arch. f. Naturg. 1841, t. v. f. 7) it is represented as having the eyes placed on the inner base of the tentacles. This mistake as to the position of the eyes was, to a certain extent, pointed out by L. Pfeiffer, who proposed a new genus (*Paludinella*) for the reception of the present species. The Baron de Ryckholt (Journ. de Conch. viii. 187) assigned it to the genus *Menestho* of Müller; but he gave no reason for such a strange allocation.

In Thorpe's 'British Marine Conchology' it bears Mr. Metcalfe's MS. name of *Cingula*? *globularis*.

Family III. CARYCHI'IDÆ.

(See Vol. I. p. 299.)

In the upper part of the shell the internal convolutions of the spire are wanting, although sometimes represented by slight ledges or the remains of the septa. This may be seen in the typical genus *Carychium* as well as in *Melampus*. The division of the penultimate from the last whorl is complete, however, in every state of growth. The only way in which I can account for the disappearance of the septa, which must therefore have been originally formed in each of the upper whorls in succession, is that the mantle in that part has an absorbent power. If the agent were an acid, the lining or inner coat of the shell would be affected; and such is not the case. *Carychium* (Vol. I. p. 300) is the first named genus of this family.

Genus II. MELAM'PUS*, De Montfort. Pl. IV. f. 2.

Body enclosed in a spiral shell: *mantle* thickened at its outer edge: *head* furnished with an extensile snout: *tentacles* club-shaped, contractile: *eyes* sessile, on the inner side of the tentacles, at their base: *foot* elongated: *respiratory orifice* and air-pouch on the right-hand side.

Shell oval or spindle-shaped: *epidermis* thin, sometimes raised so as to form a row of short bristles on each side of the upper whorls: *spire* conical, incomplete: *mouth* oblong, narrow: *outer lip* more or less thickened within, mostly toothed or fluted: *pillar* furnished with folds, two or three of which are stronger and always present; there is no umbilicus, nor operculum.

This genus has been much, and in my opinion unnecessarily, subdivided; and the only two species living on our coasts, which are closely allied, have been placed by some conchologists in different genera and removed from *Melampus*. The classification of all objects of Natural History is to a great extent artificial; and the larger groups are more difficult to define than species. I prefer reducing the number of these divisions, and thus simplifying the nomenclature, unless characters of sufficient importance can be found to distinguish them.

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* A classical name.

Lamarck's name *Auricula* has precedence of *Melampus* by many years; but the former name has been appropriated to shells, mostly tropical, of which the *Voluta auris-Midæ* of Linné is the type. The outer lip in *Auricula* has a thick and somewhat expanded edge. *Conovulus* of Lamarck is two years later than *Melampus*, and is a mere synonym. *Phytia* and *Alexia* have been proposed by Gray and Leach for *M. myosotis*; and *Ovatella*, *Iaminia*, and *Leuconia* of Bivona, Leach, and Gray have *M. bidentatus* for their type.

1. MELAMPUS BIDENTA'TUS*, Montagu.

Voluta bidentata, Mont. Test. Br. Suppl. p. 100, t. 30. f. 2. *Conovulus bidentatus*, F. & H. iv. p. 191, pl. cxxv. f. 1, 2.

BODY white, of a frosty or reticulated texture: *mantle* having its edge sometimes slightly protruded beyond the mouth of the shell: *head* furnished with a curved lobe on each side: *snout* narrow, cloven in front: *tentacles* very short, compressed, variable in shape: *eyes* proportionally large, but dull, placed a little behind the tentacles, at their base: *foot* oblong, squarish in front and rounded behind; when in action it is divided across at about one-third of its length, so as to form two creeping disks and to produce a wave-like or alternate motion: *respiratory orifice* oblong and large.

SHELL spindle-shaped, usually rather solid, nearly opaque, glossy: *sculpture*, none except just below the suture, where there are slight and close-set longitudinal striæ, scarcely visible to the naked eye: *colour* ivory-white: *epidermis* thin and varnish-like, pale yellowish: *spire* short, although rather slender, ending in a blunt and obliquely twisted apex: *whorls* 6–7, rounded and slightly convex, compressed towards the suture, and partly overlapping one another or imbricated; the last occupies about three-fourths of the shell: *suture* slight but distinct, sometimes eroded and irregularly defined: *mouth* contracted towards the top, and expanding below; it equals in length that of the remaining portion of the shell: *outer lip* having a thin edge, somewhat flexuous at the upper end, thickened and smooth inside, and bevelled outwards: *inner lip* filmy, broad, and reflected below: *pillar* thick, with two strong white folds, the smaller one twisted and near the base, and the larger one placed a little above it. L. 0·225. B. 0·1.

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* Two-toothed; properly *bidens*.

Var. *alba*. Smaller, narrower, and thinner. *Voluta alba*, Turt. Conch. Dict. p. 250 (not *V. alba* of Montagu, which is a tropical species of *Marginella*).

Habitat: Under stones that lie close to the ground, between tide-marks, on many parts of our coast from Shetland to Sark, as well as round Ireland. The variety is equally diffused. *M. bidentatus* has been found in the north and west of France, the Mediterranean, and Adriatic; and Mr. Watson sent it to me from Madeira.

It probably feeds on decaying seaweeds. When crawling under water the tentacles are withdrawn, as in the land-snails and slugs. Its locomotion is very slow, in consequence of its using alternately the front and hinder lobes into which the foot is divided. Mr. Clark for this reason considered it a *Pedipes*; but from Adanson's account the mode of progression in that mollusk must resemble the "looping" action of some caterpillars, the middle portion of the foot being hollow and widely separating the lobes. The shell of *Pedipes* is generically different from that of *Melampus*. I counted in a minute no less than 132 pulsations of the heart in a specimen of *M. bidentatus*.

Synonyms: *Ovatella bidentata* of Bivona, *Auricula dubia* of Cantraine, *A. Mitcheli* of Mittre, and *A. Bivonæ* of Philippi. My *A. erosa* is hardly a variety. *M. bidentatus* of Say must take the specific name of *corneus* given to it by Deshayes.

2. M. MYOSO'TIS*, Draparnaud.

Auricula myosotis, Drap. Tabl. Moll. Fr. p. 53. *Conovulus denticulatus*, F. & H. iv. p. 194, pl. cxxv. f. 4, 5 (as var. *myosotis*).

BODY whitish or pale grey, sometimes brindled, with a faint tinge of purple, minutely reticulated or having a frosty appearance; it is slightly shagreened at the sides: *mantle* fleshy: *snout* elongated, of a darker colour, and wrinkled, expanding into a leaf-like lobe on each side and a rounded lobe of a smaller size in front: *tentacles* thick, proportionally longer than in *M. bidentatus*, somewhat flattened above, annulated in the middle, tipped and streaked with purple, and scalloped at the edges; tips bulbous: *eyes* oblong, placed on the inner base of the tentacles, a little to the rear: *foot* oblong, thick, rather narrow, rounded at each end; the sole is usually not divided across or lobed: *respiratory orifice* rather small [*fæces* cylindrical, as in *Limnæa* (Berkeley)].

SHELL spindle-shaped, rather thin, almost semitransparent, glossy: *sculpture*, minute slight and close-set longitudinal striæ, which are more distinct just below the suture: *colour* rufous, chocolate, or yellowish-brown, purple towards the tip; in some specimens yellow is predominant, but often fades or becomes pale: *epidermis* filmy, in immature specimens raised into numerous delicate longitudinal ridges or folds, some of which form near the top of each whorl a row or coronet of hort bristles: *spire* mostly short, gradually tapering; apex blunt and obliquely twisted: *whorls* 7–8, rounded and moderately convex, partly overlapping one another; the last occupies about five-eighths of the shell: *suture* slight but distinct, nearly horizontal: *mouth* contracted above and expanded below; it somewhat exceeds in length the rest of the shell: *outer lip* thin, reflected outwards, especially on the lower part of the mouth; it is strengthened within by a ridge or callosity, which is often furnished with an obscure tubercle near the middle: *inner lip* thin, broad, folded back on the base: *pillar* thick, having two strong white folds, as in *M. bidentatus*, besides often a small tubercle above them. L. 0·325. B. 0·15.

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* Mouse-ear.

Var. *ringens*. Body yellowish-white, slightly tinged with violet. Shell yellowish-white or creamcolour, sometimes milk-white; the thickened ridge of the outer lip is furnished with several tubercles or teeth, which now and then form transverse plaits and give a fluted appearance, as in tropical species of *Melampus*; the pillar has never less than three folds, and has sometimes additional tubercles on the upper part. *Voluta ringens*, Turt. Conch. Dict. p. 250.

Habitat: Abundantly on mud-flats and salt-marshes in all estuaries. The variety frequents the open sea-coast, and lives in crevices of rocks and piers, as well as on shingly beaches, near high-water mark. Marcel de Serres (Bull. Sc. Soc. Philom. Paris, 1814, vol. i. p. 17) noticed the occurrence of this species as fossil in a bluish marl which was cut through in making a canal from the Rhone to Marseilles, 5 or 6 feet deep, near Boisveil, in the Département of the Bouches-du-Rhône. *Conovulus myosotis* (?) of Searles Wood, from the Red and Norwich Crag, is (as he suspected) a different species; it is unknown to me as recent. The typical form is widely diffused along the European shores of the Atlantic between Nordeney (Menke) and Faro in Algarve (Morelet), on both sides of the Mediterranean, and in the Adriatic; Madeira (Watson); Jamaica (Barrett); United States (Gould, Stimpson, and others). The variety has been found in the north of France and at Naples; it is the *Carychium personatum* of Michaud.

There has been a considerable diversity of opinion among conchologists as to the proper habitat of this species, reminding one of the story of the chameleon. Montagu and Férussac considered it marine, and Dupuy as quasi-marine, while Draparnaud, Lamarck, and others included it with the land-snails. Bouchard-Chantereaux has given a good account of its habits. According to him the animal is rather timid; when you hold it by the shell, it stretches itself out and seeks a point d'appui; it feeds on the débris of seaweeds, and loves moist, dark, and saltish places; it can live a long time in sea-water, but soon dies on immersion in fresh water. I may, however, remark that I kept several living specimens in pure spring-water for two hours, and that, soon after they were taken out of the water, all of them revived and crawled about. The French naturalist goes on to say that when the animal crawls on a piece of glass, only a slight undulation can be seen at a time, being caused by the muscular action of the foot; this movement proceeds from the hinder part of the foot, and terminates at the anterior end before another undulation begins. [Gould describes the foot as "transversely divided at the anterior third."] It lays from 12 to 30 eggs in the summer; these are agglutinated by a viscous matter, so as to form a small group, which is attached to the underside of moist stones. The eggs are globular, yellowish, and quite transparent, about one-third of a millimètre in diameter. They are hatched in about 15 days after being laid; and the young do not attain full maturity till the end of the second year. It does not hibernate. In describing the animal he mentions two round and reddish spots on that part of the head where in most of the *Helicidæ* the lower pair of tentacles are placed. This I have not observed in English specimens. The shell of the variety *ringens* often exhibits the remains of two or three disused outer lips with their successive rows of teeth or plaits. Its surface is occasionally eroded, probably by some solvent action of the sea-water. This species differs from *M. bidentatus* in its colour and larger size, its plicated and bristly epidermis, and having the outer lip more or less reflected. The finest specimens I have seen were collected by Mr. Gibbs at Swanage. It varies not only in dimensions, but in the comparative length of the spire, which is sometimes as conical and short in proportion to the rest of the shell as in typical species of *Melampus*.

The earliest knowledge we have of *M. myosotis* is derived from Walker's figure 50. It is the *Voluta denticulata* of Montagu, and in its younger state the *Auricula ciliata* of Morelet. The variety is not only *Voluta ringens* but *V. reflexa* of Turton, *Auricula tenella* of Menke, and *Iaminia quinquedentata* of Brown.

Voluta bullaoïdes of Montagu, from the Portland Cabinet (my *Auricula multivolvis*) is a rather common West-Indian species. Baron Férussac gave me a specimen which Mr. Bean had sent him as found at Scarborough; and M. Cailliaud has lately recorded it from Croisic in the Loire-Inférieure.

M. pusillus, Gmelin (*Voluta triplicata,* Donovan) is also West-Indian. Montagu received it from Guernsey; and Turton's locality is "Paington sands, Torquay."

Family IV. OTI'NIDÆ.

Body fleshy, rather large for the shell, within which the animal can scarcely withdraw itself: *mantle* thick: *head* proboscidiform: *tentacles* very short, lobular: *eyes* sessile, one on the centre of each tentacle: *foot* oval, more or less divided across the middle: *respiratory orifice* forming a narrow slit on the inner or pillar side of the shell.

Shell ear-shaped: *epidermis* thin, closely investing the surface: *spire* complete, extremely short, lateral, apex introverted: *mouth* very large and open: *outer lip* plain: *operculum* none.

Some of the above characters are anomalous, although they seem to connect this family with *Melampus* on one side and *Succinea* on the other. The shell resembles that of *Velutina* in shape; but in that genus the epidermis is thick and velvety, and the apex of the spire is twisted outwards instead of inwards, and is closely striated in a spiral direction. *Lithotis rupicola* of Blanford, from Bombay Harbour, probably belongs to the only genus of the present family, viz. the

Genus OTI′NA*, Gray. Pl. IV. f. 3.

The natural position of this genus was first pointed out by L. Pfeiffer, who included it in the *Auriculacea.* It had been previously placed by Gray, Woodward, and other writers with *Velutina,* and by Forbes and Hanley in the *Pyramidellidæ.* Dr. Turton made a better guess when he called it a *Helix.*

OTINA OTIS†, Turton.

Helix otis, Turt. Conch. Dict. p. 70. *O. otis,* F. & H. iii. p. 321, pl. xcix. f. 2, 3, and (animal) pl. OO. f. 4.

BODY almost clear white; when active it is not containable within the shell, but when at rest it shrinks up: *mantle* lining the inner edges of the shell: *head* furnished with an expanded veil or hood, which is bilobed or divided in front and broader than the anterior part of the foot; it assists the foot in crawling: *mouth* forming a narrow perpendicular slit, through which the short and spinous odontophore is seen in action: *tentacles* ear-shaped or triangular under water, bulbous or tubercular in the air: *eyes* black and distinct, each seated on the middle of a tentacle: *foot* truncated in front, and rounded behind, slightly constricted in the middle, where sometimes a crease appears: *respiratory orifice* small, placed about halfway between the head and the extremity of the foot.

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* Derived from the name of the species on which this genus is founded.

† From *οὖς, ὠτὸς,* an ear.

Shell shaped like a miniature *Haliotis* or *Velutina*, rather thin, semitransparent, of a somewhat dull and dusky hue: *sculpture*, microscopic, slight, wavy, and close-set longitudinal striæ, covering the surface with the exception of the apex, which is quite smooth and glossy: *colour* reddish-brown of different shades, with a purplish tinge: *epidermis* indistinct: *spire* minute, conspicuous although not prominent; apex obliquely twisted inwards: *whorls* 2 only, convex; the last occupies nearly all the shell, and is expanded in front; apical whorl bulbous: *mouth* forming a short oval, and exceeding in size two-thirds of the under surface; it does not expose the interior of the spire; inside polished: *outer lip* sharp-edged: *inner lip* consisting of a narrow rim behind the pillar, and continuous with the outer lip: *pillar* broad, flattened, and excavated. L. 0·1. B. 0·075.

Var. *candida*. Pure white.

Habitat: Rocks between tide-marks, on *Lichina pygmæa* and other small seaweeds, as well as inside the empty walls of *Balanus crenatus*, and among dwarf *Mytilus edulis*, on the northern and southern coasts of England, South Wales, Channel Isles, and west of Ireland; Sandwich and Reculver (Walker); Isle of Man (Forbes); Arran, N.B. (Norman). It is not uncommon; and if properly searched for, it would doubtless be found in every suitable locality. The variety occurs in a cave at Sark. The known foreign range of this species is at present limited, viz. Etretat, Normandy (J. G. J.); Brest (Daniel, *fide* Baudon); Quibéron and Piriac, Loire-Inférieure (Taslé and Cailliaud).

It is a restless little creature, and when put into sea-water crawls directly out of it.

Walker's figure 17 is not a bad representation of this remarkable shell. Brown described it as *Galericulum ovatum* and *G. otis*.

Class PTERO'PODA *, (PTÉRO-PODES) Cuvier.

Body gelatinous, spiral, oval, or conical: *head* less distinct in those kinds which have shells than in the naked kinds: *mouth* placed at the bottom of a cavity between the foot-lobes, and armed with a spinous tongue or odontophore: *tentacles* in the naked kinds only, in some species of which they are furnished with cup-shaped suckers: *eyes* in *Clio*, *Clione*, and *Cymbulia* (De Blainville), in *Clione* (Leach), wanting in all the Pteropods (Rang and Souleyet): *foot* expanded into two wing-like lobes, one on each side, which are used chiefly for swimming or floating: *gills* internal in the testaceous, and external in the shelless kinds. Hermaphrodite.

Shell (in those kinds that possess one) univalve, thin, vitreous or membranous, forming a reversed coil, a nearly globular and often tricusped case, a sheath, or a slipper.

These are small gregarious mollusca, inhabiting the wide ocean, where they swim or rather float in a reversed position, by flapping the wing-like lobes of the foot. They are strictly pelagic, and never of their own accord come near the land. Indeed their power of locomotion is very limited, and consists of a jerking action, by which they move up and down in the water, either in a straight line or obliquely; this appears to be effected by opening and closing their foot-lobes. It has been stated that their habits are nocturnal or crepuscular; and for this reason they have been called Neptune's moths instead of butterflies, and accused of leading a gay and dissipated life, like midnight roisterers. D'Orbigny imagined that each kind occupies a different bathymetrical zone. Souleyet and other naturalists, however, dispute these assumptions; and there is no doubt that every known species has been found on the surface, and by day as well as by night—as any observant traveller, who has crossed the Equator, can testify, their capture, with a towing-net or ship's bucket, being an agreeable diversion, and relieving the tedious monotony of a long sea-voyage. Their food consists of minute Entomostraca and other animals. Considerable attention has been paid of late years to the physiology and development of the Pteropods. According to Vogt, Gegenbaur, and Krohn (all first-rate zootomists), the larva has a circle or crown of strongly marked vibratile cilia, which are absorbed or fall off in a subsequent period of growth. They swarm within the tropics, but are scarce in northern seas, whither some exotic kinds are now and then wafted by the south-west winds and consequent drift, arising from the Gulf-stream. Their occasional appearance on our own coasts, and their claims to be indigenous, rest on the same grounds as the case of *Ianthinæ*; and naturalists must please themselves as to considering such accidental wanderers British or foreign. Two kinds at least have been found alive in our seas.

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* Foot wing-like.

It is very doubtful whether this group, although peculiar, ought to constitute a distinct class, or be included in the Gastropoda, to which it is certainly related, as regards the foot-lobes, through *Bulla* and *Aplysia*. Nevertheless its connexion with the Cephalopoda cannot be remote, because two genera (*Pneumodermon* and *Spongiobranchia*) have arms furnished with sessile cup-shaped disks or suckers. It may be better, on the whole, to retain the classification of Cuvier. The order of arrangement for the Mollusca in an ascending series will thus stand: Class 1. Brachiopoda. 2. Conchifera. 3. Solenoconchia. 4. Gasteropoda. 5. Pteropoda. 6. Cephalopoda.

Order I. THECOSO'MATA, De Blainville.

Body enclosed in a shell: *head* more or less indistinct: *gills* internal.

Family I. LIMACI'NIDÆ, Gray.

Body small, spiral.

Shell heliciform and sinistral: *mouth* oval, with an angulated base: *operculum* solid, glassy, ear-shaped, and few-whorled.

Genus SPIRIA'LIS*, Eydoux and Souleyet. Pl. IV. f. 4.

So little is known of the genus *Limacina* (the only other recorded member of the family as distinguished from *Spirialis*), that I must refer to the general description for the characters of the present genus. Perhaps *Spirialis* does not differ from *Limacina*, in which case *Limacina*, being older, should be the generic name. *S. rostralis* of Souleyet, which has a discoidal shell, with a curved and prominent beak, may be the type of a new genus, to be called *Embolus*.

Gray, H. & A. Adams, and Mörch have lately adopted *Heterofusus* as the generic name, on Fleming's authority. But this name (which is prior to *Spirialis*, and subsequent to *Limacina*) was unaccompanied by any description, and was suggested by Dr. Fleming under a misapprehension that the type was "a reversed species of *Fusus*," and allied to "*Murex contrarius* of Sowerby's 'Mineral Conchology.'" Five years after the publication of *Heterofusus* in the 'Memoirs of the Wernerian Society,' the author retained the only species of which he seems to have been aware in *Fusus*. Forbes called the genus *Peracle*, and Philippi *Scæa*.

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* Having a spire: a barbarism.

SPIRIALIS RETROVER′SUS*, Fleming.

Fusus retroversus, Flem. in Mem. Wern. Nat. Hist. Soc. iv. p. 498, t. xv. f. 2. *S. Flemingii*, F. & H. ii. p. 384, pl. lvii. f. 4, 5, and (animal) pl. MM. f. 1.

BODY more or less tinged with purple: *foot-lobes* or wings "shaped something like the petals of a catch-fly, rather truncated at the extremity, furnished with a small lobe halfway down their undersides, and another small rounded lobe at their lower bases" (Forbes), extremely long (Rang and Souleyet).

SHELL resembling that of *Physa* in shape, but more rounded at the base, very thin and fragile, almost transparent, glossy, and having a prismatic lustre: *sculpture* none: *colour* clear-white, with a faint tinge of yellow in living specimens: *spire* variable in length, but usually short, regularly elevated; apex mammillar: *whorls* 5, swollen, each slightly turreted at the top; the last exceeds in size half the shell: *suture* narrow, excavated: *mouth* trapezoidal, contracted in front, somewhat expanded below, and forming a sharp angle at the basal point; its comparative length is in proportion to that of the spire: *outer lip* gently curved, abruptly inflected towards the periphery: *inner lip* wanting on the periphery, and reflected on the *pillar*, which is straight: *umbilicus* small, but distinct and deep in full-grown specimens. L. 0·075. B. 0·0625.

Var. 1. *Macandreæ*. Spire longer. *S. MacAndrei*, F. & H. ii. p. 385, pl. lvii. f. 6, 7.

Var. 2. *Jeffreysi*. Spire shorter. *S. Jeffreysii*, F. & H. ii. p. 386, pl. lvii. f. 8.

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* Turned backwards.

HABITAT: Everywhere along our coasts, in drifted and dredged sand, particularly the latter. The two varieties insensibly diverge from the typical form; but it is impossible to make out any specific difference, if a sufficient number of specimens are compared. That from which Forbes and Hanley's description of *S. Jeffreysii* was taken is a very young shell. Pliocene and quaternary strata in Calabria and Sicily (Philippi and Seguenza, as *Scæa stenogyra* of the former, and *Spirialis globulosa* of the latter, corresponding with the varieties *Macandreæ* and *Jeffreysi*); newer or postglacial deposits in the Christiania district (Sars, Crosskey and Robertson). North Atlantic, 170–550 f. (Dr. W. B. Carpenter and Prof. Wyville Thomson); Scandinavian coasts (Lovén and others); mid-Atlantic (Wallich); Gulf of Naples (Tiberi); Canaries (M'Andrew); New England (Stimpson, as *S. Gouldii*); Nahant, U. S. (A. Agassiz); "toutes les mers" (Rang and Souleyet, as *Limacina naticoides* of Rang, and *S. trochiformis* of Souleyet). My supposed specimen from Piedmont is the embryonic shell of a Nudibranch.

This common and widely distributed species has not often been taken alive in our seas. Prof. E. Forbes observed it on the north-west coast of Skye in 1850; and the Rev. A. M. Norman, during our Shetland dredging-cruises in 1861 and 1867, caught great numbers, of different ages from the fry to the adult, in the towing-net, as well as in his hand-net close to the shore. The animal, when placed in a bottle of sea-water, did not flutter like a butterfly, but rose straight upwards to the surface in regular jerks, and then dropped gently to the bottom, as if exhausted by the exertion. This alternate action was repeated several times. Mr. A. Agassiz says (Proc. Boston Soc. N. H. 1865) that "they can creep about by means of their wing-like appendages, and remain suspended in the water for hours simply by spreading, and suddenly drop to the bottom by folding them." I have failed to detect an operculum, although Dr. Carpenter kindly assisted me in the examination, and many specimens were sacrificed at the altar of science.

S. retroversus ought not to have been mistaken by the discoverer for a miniature *Fusus*, which has a channelled mouth. I must likewise protest against the practice of changing specific names on the pretext that they are inappropriate—and especially in the present case, where *Flemingii* has been substituted for *retroversus*. Although all the species of *Spirialis* are sinistrorsal, this is the original type, and rightly characterized by the name. *Balia perversa* is in the same category; and the specific name of *Cypræa Europæa* is not less correct because there are other European species of the same genus. Names, after all, are mere symbols of distinction; and it is quite immaterial whether they are appropriate or not.

Two specimens of a microscopic shell, somewhat resembling *S. bulimoides* of Souleyet, were found by Dr. Alcock in Roundstone Bay, Connemara. The spire is more slender, and the whorls fewer than in *S. retroversus*. I will not venture to propose a new species for objects so minute, as they may possibly turn out to be the fry of some Nudibranch.

A specimen of *Cavolina trispinosa*, Lesueur, was washed ashore at Youghal, with *Spirula australis*, a tropical Cephalopod; they must have been carried by the Gulf-stream to the Bay of Biscay, and afterwards brought by the prevalent south-westerly winds and tidal currents to their destination.

Family II. CLI'IDÆ.

Body forming an elongated cone.

Shell pyramidal or lanceolate: *operculum* none.

Woodward's family of this name is founded on the genus *Clione*, which he called *Clio*.

Genus CLIO*, Browne. Pl. IV. f. 5.

Body triangular, and ending in a long spike.

Shell pyramidal, compressed at the sides, and ridged lengthwise, or spinous: *mouth* wide and angular.

Clio is perhaps the only phosphorescent kind of Pteropod. Eschscholtz, in his figures of *Pleuropus*, which does not appear to differ from the present genus, and of *Cresis* or *Styliola* (Zool. Atl. p. iii, t. 15), represents the animal as having two eyes; and De Blainville says the same. The doubt as to the existence and position of these organs ought to be set at rest. But with respect to the shell, there can be no question: it is

> "Brighter than glass†, and yet, as glass is, brittle."

I need scarcely tell my readers that most of the poetical quotations in this work are (except where otherwise stated) also from Shakespeare.

It is the genus *Cleodora* of Péron and Lesueur. Linné described all his species of *Clio* (viz. *caudata*, *pyramidata*, and *retusa*) from Browne's 'History of Jamaica;' and his reference to Marten's 'Voyage to

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* A daughter of Oceanus.

† "*Splendidior vitro*" (Hor. C. iii. 13).

Spitzbergen and Greenland,' after the description of *C. caudata,* was merely incidental. He does not seem to have himself known any Pteropod. *Clione papilionacea* of Pallas (*Clio borealis,* Bruguière) was described by Müller and Fabricius under the name of *Clio retusa,* erroneously supposing it to be Linné's species. The genus *Clione* was established by Pallas in 1774, before the name *Clio* was misapplied by Müller and other writers.

CLIO PYRAMIDA'TA*, Browne.

Clio pyramidata, Browne, Civ. & Nat. Hist. Jamaica, p. 386, pl. 43. f. 1.

BODY opaque, slender, and pointed at the bottom, capable of protruding beyond the shell or sheath: *head* small and round, "adorned with a little sharp bill:" *eyes* beautiful green: *foot* forming two transparent membranous expansions, by which the animal moves with great celerity on or under the surface of the water. (Browne.)

SHELL triangular, convex in front and slightly concave on the back, abruptly sloping to a fine point, extremely thin and fragile, quite transparent, and lustrous: *sculpture,* 5 ridges in front and 1 at the back; the former are symmetrical, the outermost two being the largest, and the central one intermediate in size between those and the other two ridges; dead shells exhibit also numerous transverse and flexuous striæ, especially on the back: *colour* clear-white: *apex* spearhead-shaped or sharply ovate, separated by a very narrow line from the rest of the shell: *mouth* arched in the middle, and sloping with a gentle curve to each side. L. 0·5. B. 0·3.

HABITAT: Muddy sand, in 60–84 f., on the north-eastern and north-western coasts of Shetland; rare. One specimen only contained the animal; and that was in a collapsed state; the others were more or less imperfect. Carpenter and Thomson's dredgings in the

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* Pyramidal.

North Atlantic, at depths of from 189 to 650 f., also yielded dead shells and fragments. Fossil: Asti (Rang); Sicily (Scacchi and Philippi); older and newer pliocene near Messina, and quaternary formation at Milazzo and Gravitelli (Seguenza); Arctic Sea (Walker and Barrett); Drontheim (M'Andrew); Faroe I. (Olrik and others, *fide* Mörch); Mediterranean (Cantraine, Scacchi, and others); Ægean (Forbes); Atlantic Ocean and Guinea (Rang); Florida side of the Gulf-stream, and Havannah (Count L. F. Pourtales).

According to Aucapitaine it is common on the coast of Algiers, especially on fine nights in the month of October. One living specimen, on being put into fresh water, ejected a bluish liquid, with a strong smell of varnish. I have observed a similar colouring-matter in the dried animal of *Spirialis balea*. It is strange, and by no means creditable, that we are obliged to have recourse to the unsatisfactory account of the animal given by Browne in 1789.

The *Hyalæa lanceolata* of Lesueur, and *Cleodora Brownii* of De Blainville.

Our Shetland dredgings in 1864 produced three or four fragments of a shell which evidently belongs to another species of *Clio*. The apex is globular, and the terminal portion is compressed and keeled on each side. In the latter respect it agrees with *Cleodora infundibulum* of Searles Wood (Crag Moll. Un. p. 191, t. xxi. f. 14, *a*, *b*), which was described and figured from imperfect specimens; this species occurred in the Coralline Crag at Sutton. It is probably *Clio caudata* of Linné ("vagina compressa, caudata," Browne), and *Cleodora compressa* of Souleyet.

Order II. GYMNOSO'MATA, De Blainville.

BODY naked or not having a shell: *head* distinct: *gills* external.

The only member of this order which seems to have been observed on the British coasts is *Clione papilionacea* of Pallas (*Clio borealis*, Bruguière = *Clio retusa*, Müller and Fabricius), a native of the Arctic Seas, and partly the reputed food of the true whale. Dr. Leach says that during a tour to the Orkneys (query Hebrides?) in 1811 he found several mutilated specimens on the rocks, and succeeded in capturing one alive while rowing along the coast of Mull. Dr. Mörch reminds me that in the 'Isis' for 1823 (ii. p. 459) Oken mentions a specimen in the Museum of the Jardin des Plantes from Falmouth, and that Faber noticed this mollusk as found in the Cattegat at Lessö. This latter statement may have been the authority for the locality given by Lovén in his 'Index.'

Class CEPHALO'PODA*, (CÉPHALOPODES) Cuvier.

BODY cylindrical or oval, fleshy, covered with pigment-spots (chromatophores): *mantle* pouch-like, in some kinds expanded on each side into a fin or lobe, and in every kind forming above in the middle of the ventral area a pipe or inverted funnel, analogous to the fold in the Siphonobranchiate Gastropods: *tentacles*, in the Decapods, 2, long, flexible, contractile, and armed with cup-shaped suckers (acetabula) on the inner side, and usually only on that part, of their club-shaped extremities: in *Nautilus* they are numerous, short, and unarmed: *head* large and distinct: *mouth* circular, with a muscular lip: *jaws* resembling a parrot's beak, and consisting of two horny pieces that overlap one another: *eyes* sessile (except in *Nautilus*, where they are pedunculated), very large and prominent, and of a complicated structure: *foot* divided into 8 lobes called arms, which in the Dibranchiata are closely studded on the inner side with cup-shaped suckers, like those of the tentacles; these arms serve for catching and retaining the prey, as well as for crawling: *gills* internal, 2 or 4, symmetrical, pyramidal, and laminar. Sexes separate.

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* From the head being surrounded by feet.

SHELL, when present, in the Dibranchiata mostly internal and supporting the back, and consisting of a cartilaginous or cellular plate; but in *Argonauta* it is external, and forms a single nautiloid chamber; and in *Spirula* it is partly external, and forms a spiral of several chambers, the last of which is occupied by part of the body; in the Tetrabranchiata it is invariably external, nautiloid in shape, and formed of numerous chambers, the last of which contains the whole body.

The Cephalopoda, including the "Squids" and "Cuttlefishes" (which are the only British kinds), are the highest class of the Mollusca, having a more specialized organization than any other class; and they are in many respects allied to the true fishes. Their history also is more ancient, the *Octopus vulgaris* (πολύπους) with its suckers being used as a simile in the Odyssey. Aristotle seems to have been intimately acquainted with all the principal kinds living in the eastern archipelago of the Mediterranean, as well as with their anatomy, habits, embryology, and sexual conditions, including the *hectocotylus*, or that strange terminal process of one of the arms of the male *Argonauta* which is developed at the proper season, and serves for propagation. This last remarkable fact was not rediscovered until 1841, when Delle Chiaje, and afterwards Verany, noticed it. The inky fluid which all Cephalopods emit, from fear or in order to escape detection, was compared to urine by the celebrated Greek naturalist and philosopher, who considered its receptacle an analogue of the bladder in Vertebrate animals. The purple fluid of *Aplysia* is probably of the same nature. Some of his successors dealt more in fabulous tales than in such accurate and careful investigations. I will content myself with giving a sample of these stories. According to Oppian the Polypus is so voracious that when it keeps its den in winter as a shelter from storms, and can procure no food, it eats its own arms, which soon grow again, so as to be always ready to appease its hunger; and sometimes in the summer it climbs olive-trees to get at the fruit. Ælian tells us that a Polypus, which had grown to the size of a whale, crept up a sewer into the house of a merchant at Puteoli, and devoured his stock of salt fish. Not less credulous in modern times was Denys de Montfort, whose "poulpe colossal," in the act of scuttling a three-master, is represented in the woodcut (copied from Sonnini's edition of Buffon) at the end of this subject. Victor Hugo's fanciful account of the "pieuvre" (*Octopus vulgaris*), in his 'Travailleurs de la mer,' is more excusable, because he does not pretend to be a naturalist. But the real men of science, from Swammerdam and Lister to Cuvier, Owen, and Steenstrup, who have studied the Cephalopods in every aspect, are very numerous; and I regret that want of space prevents my doing justice to their researches. Two or three points yet remain to be cleared up. Lovén regards the funnel as the homologue of a foot ("pes in tubum propulsorium efformatus"); but Mecznikow disputes this; and I am inclined to agree with the Russian zoologist, for the reason inferentially assigned in my description of the class. Aristotle says that when the female *Sepia* has laid its eggs, the male swims about and sprinkles them over with its milt, a mode of fertilization supposed to be peculiar to certain fishes; and that the *Octopus* incubates or broods, taking no nourishment during that period, and consequently becoming weak and much reduced in size. He gives about two years as the duration of life for all the Cephalopods. None of the above observations have been confirmed. There can be no doubt that this class comprises the giants of the Mollusca, bearing the same relation as whales to other Mammalia and sharks among the Fishes. The kraken, even, may not be an absolute myth, but one of the endless wonders

’Εξ ἁλὸς, οἷά τε πολλὰ τρέφει κλυτὸς ’Αμφιτρίτη.

Prof. Steenstrup has collected several trustworthy accounts of such monsters, which he refers to a species of *Architeuthis*, his *A. monachus*. One of these, described in Paulsen's MS., was cast ashore on the Danish coast; its body measured 3½ fathoms, and the tentacles 3 fathoms, a total length of 39 feet. Dr. Mörch informs me that another was found in 1854 at the Skag, in Jutland, which filled a large cart; its beak was 9 inches long. The mutilated carcase of a huge Cephalopod, perhaps belonging to Steenstrup's species, was stranded in 1860 or 1861 between Hillswick and Scalloway, on the west of Shetland. From a communication received by Prof. Allman it appears that the tentacles were 16 feet long, the pedal arms about half that length, and the mantle-sac 7 feet; the mantle was terminated by fins; one of the suckers examined by Prof. Allman was ¾ inch in diameter. Dr. Johnston, after showing that the adhesion of the suckers in some Cephalopods is strengthened by a horny ring round the edge of each, which is often armed with sharp incurved teeth, remarks :—"It must, then, be a fearful thing for any living creature to come within their compass; for, entangled in the slimy serpentine grasp of eight or ten arms, and held by the pressure of some hundreds of exhausted cups, escape is hopeless; and the struggles of the hapless victim, by bringing its body into more rapid contact with the suckers not yet applied, only accelerate its fate." The Cephalopods subsist on fishes, mollusca, and crustacea. Although they are mostly zoophagous, as well as ferocious, Johnston observed that *Ommatostrephes todarus* was phytophagous also. They are a favourite food of fishes, and make the best bait; gulls and other sea-fowl prey on them; and in the Mediterranean, from Homeric times, man has esteemed them as delicacies. Aristotle states that when in spawn they are better eating. They usually swim backwards by the action of the ventral muscles, the water taken in at the open part of the mantle-sac being ejected through the funnel in a continuous stream, and causing a repellent motion. The members of the *Loligo* family, however, use their fins and swim forwards. Sailors have given some of them the name of "flying squids," from their habit of leaping out of the water, often to such a height as to fall on the decks of vessels; whether their fins serve the purpose of wings may be doubted. They crawl by means of the foot-lobes or arms, and seize their prey with the tentacles, by which they also moor themselves when at rest. Barbut compares the noise made by a cuttlefish, on being dragged out of the water, to the grunting of a hog. The sudden changes of colour and the pigment-spots or chromatophores (which latter were at one time supposed to shift their places, but are now known to be merely extensile and compressible at the will of the animal) were first noticed by

Cuvier, and subsequently more fully investigated by De la Fresnaye, the title of whose paper*, "Sur la mobilité des taches que l'on remarque sur la peau des *Calmars subulé* et *sépiole* (de Lamarck), et sur la coloration spontanée dont les sépiaires paraissent susceptibles," will speak for itself. He inferred that this characteristic phenomenon was similar to that of the chameleon. All Cuttlefishes are more or less phosphorescent. The eyes have a microscopic property, and may almost serve as magnifying-glasses. "China ink" or "Indian ink" was formerly supposed to be prepared from the fluid of some kind of Cuttlefish; but it has now been ascertained that the base of this paint is soot from the smoke of oil-lamps. "Sepia," however, has a more legitimate origin. Cuvier used the colouring-matter of *S. officinalis* to illustrate the plates in his famous 'Mémoires.' The odontophore of the Cephalopods somewhat resembles that of the Pteropods (Woodward).

The derivation of the word "cuttle" is given in the 'Imperial Dictionary' as from the Saxon verb "cudele," in Welsh "cuziaw," and in Armorican "cutaff" or "cuddyo," all signifying the sense of withdrawing or hiding; hence our pet word "cuddle."

This class is the Cryptodibranchiata of De Blainville.

Order **DIBRANCHIATA**, Owen.

Body naked: *gills* 2.

Mr. Hyatt (Mem. Bost. N. H. Soc. n. s. i. pt. 2. p. 208) calls these the "polar" forms of the Pteropoda, and observes that "the general aspect, the arrangement and position of the oral region, and the disposition of the internal organs are the same in both."

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* Mém. Soc. Linn. du Calvados, 1824, pp. 73–84.

A. *DECA'CERA,* De Blainville. *Decapoda,* Fér. and D'Orb.

Mantle expanded on each side: *tentacles* 2, elongated, enlarged and club-shaped at the extremity: *arms* 8; each sucker supported by a short stalk, and encircled by a horny ring: *gills* partly attached.

Shell consisting of a cartilaginous or cellular plate.

Family I. TEU'THIDÆ, Owen.

Mantle furnished on each side with a fin or wing-like lobe.

Shell cartilaginous or laminar, and pen-like.

† Body elongated and cylindrical: *fins* triangular, coalescing at the base of the mantle, so as to form a rhomb: *sucker-cups* having their edges spinous.

Commonly known as "Squids." They often swim in shoals. The larger kinds, as well as the *Sepiæ,* are in great request by the fishermen on our southern coasts for bait. They are caught by trawling, and also close to the land with a seine net, or from a boat with a rod and long line. In the last case, when the squid or cuttlefish is hooked, it is drawn in slowly, and, then, being gaffed in the tail, it is held at a short distance from the boat to allow it to discharge its ink. It is said that they frequent the shore in pursuit of the fry of pilchards and other fishes, and that the young squids take shelter in the mantle-pouch of their parent.

Genus I. OMMATO'STREPHES*, (*Ommastrephes*) D'Orbigny. Pl. V. f. 1.

Eyes naked, and provided with a deep lachrymal sinus.

Shell terminating at its lower extremity in a small open pouch.

The difference between this genus and *Loligo* is very slight.

1. Ommatostrephes toda'rus†, Delle Chiaje.

Loligo todarus, D. Ch. Mem. An. s. Vert. Nap. iv. t. lx. *Ommastrephes todarus*, F. & H. iv. p. 233, pl. RRR. f. 2.

Body tapering to a blunt point: *fins* flanking the lower part ($\frac{1}{3}$–$\frac{1}{2}$) of the mantle: *tentacles* almost as long as the body; their under surfaces are covered with suckers nearly to the base; at first the suckers are very small, but they become suddenly larger towards the extremities; small suckers on longer stalks are intermingled with the larger ones; each sucker is encircled by a horny denticulated ring: *mouth* having its lip studded with suctorial papillæ: *arms* stout, unequal in size and length, the two lateral pairs being the longest; every arm has 2 rows of suckers; the arms are united at their base by a webbed membrane. L. (exc. tent.) 12–15. B. (exc. fins) 3–3·5

Shell straight, ribbed in the middle and at each side, dilated above, contracted below into an oblong blade, and terminating in a small pouch. L. 10–12. B. 0·5.

Habitat: Berwick Bay (Johnston); Northumberland and Durham (Alder, as *Loligo sagittata*); Moray Firth (Stables, *fide* Gordon); Scottish seas, common (Fleming, as *L. sagittata*); Firth of Forth (Forbes); Youghal (Ball); Cork (Allman); Norway (Sars); Boh.–Finm. (Lovén);

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[*] Turning its eyes; properly *Ommatostrophus*.

[†] Possibly from *todi*, a kind of small birds.

Faroe I. (Landt, as *Sepia loligo,* and Steenstrup); Mediterranean (Verany); Naples and Sicily (Philippi).

Feeds occasionally on seaweeds, especially *Alaria esculenta.* "Ink of a blackish-brown colour or dark olive-green" (Johnston).

2. O. SAGITTA'TUS*, Lamarck.

Loligo sagittata, Lam. Mém. Soc. H. N. p. 13. *Ommastrephes sagittatus,* F. & H. iv. p. 231, pl. RRR. f. 1.

BODY pinkish or fleshcolour, covered all over with numerous red and brown spots, all of them small and some minute: *fins* resembling a broad arrow-head, from $\frac{2}{5}$ to nearly $\frac{1}{2}$ the length of the mantle: *tentacles* nearly two inches longer than the mantle; their stalks are cylindrical, quite smooth, and free from suckers; the clubs are narrow, and represent about $\frac{1}{3}$ of the total length; the largest suckers are in the middle, and the smallest at each end of the club: *arms* having the suckers arranged alternately in two rows, one on each side, the middle being smooth; those on the outer and inner extremities are very minute and crowded; the two lateral pairs of arms are the longest, as in *O. todarus*; all the arms are crested on the back and webbed at the base; there are no suckers near the mouth. L. 14. B. 4.

SHELL resembling a very long oar with a broad handle, the blade occupying not much more than $\frac{1}{5}$ of the whole length: *sculpture,* a microscopic granulation in some parts; besides the midrib, which extends all the way, the haft has from 2 to 4 slighter ribs on each side, and the blade is closely but irregularly striated lengthwise. L. 11. B. 0·4.

HABITAT: Brighton (Dowager Marchioness of Hastings, *fide* Forbes and Hanley); Folkestone (Mackie, on same authority); Guernsey (Gallienne and Cooper); Falmouth (Cocks); Polperro (Laughrin). L'Orient (Gand, *fide* Taslé); Arcachon (Lafont); Mediterranean, from Nice to Sicily (Risso, Philippi, and others); Venice (Nardo).

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* Provided with arrows.

Verany says it is migratory. De Blainville named it *Loligo sagittata*; and Cantraine erroneously considered it the younger state of *O. todarus*.

The *Loligo Eblanæ* of Ball (Proc. R. Ir. Ac. i. p. 362, pls. 1–7), from Dublin Bay and Lough Strangford, appears to be the female of *O. sagittatus*. He evidently did not know the latter species, for which he mistook *O. todarus*. Through the kindness of Prof. Wyville Thomson I have examined the late Mr. Wm. Thompson's specimen of *O. Eblanæ* referred to by Forbes and Hanley.

Genus II. LOLI'GO*, Schneider. Pl. V. f. 2.

Eyes covered with a membrane, which has a small opening; no lachrymal sinus.

Shell terminating in an open point.

Gould says as to *L. illecebrosa*, which is the most common species on the Massachusetts coast, that "they devour immense numbers of small fish, and it is amusing to watch their movements and see how, at a distance of several feet, they will poise themselves, and in an instant, with the rapidity of lightning, the prey is seized in their long arms, and instantaneously swallowed."

1. Loligo vulga'ris†, Lamarck.

L. vulgaris, Lam. Mém. Soc. H. N. p. 11; F. & H. iv. p. 226, pl. LLL.

Body pale fleshcolour or yellowish-white, closely speckled with purplish-brown; it is rather slender: *fins* broad and obtuse-angled, extending about $\frac{2}{3}$ the length of the mantle, and coalescing at its base: *tentacles* vermiform, as long as the head and mantle together, smooth for $\frac{5}{6}$ of their length; club armed with numerous and crowded suckers, which are irregularly arranged in 4 rows ; the suckers are largest in the middle, diminishing in size towards the base, and minute at the extremity : *funnel* or pipe large and conical : *head* long : *arms* rather short and thick, curled when in a state of contraction ; the largest pair is the second, on the ventral or lower side ; suckers arranged in 2 irregularly alternate rows ; web small and thin. L. (exc. tent.) 18–24.

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* The ancient name of this kind of Cephalopod.

† Common.

SHELL not unlike the sheath of an ear of maize ; haft occupying about $\frac{1}{4}$ of the total length ; extremity tapering to a fine point ; midrib strong and quill-like on the haft, and gradually lessening in size towards the other extremity or point. L. 15–18. B. 1·25–1·5.

HABITAT : Aberdeenshire to Cornwall. Its foreign distribution appears to be very extensive, although it is possible that other species may have been confounded with it, under the names of *Sepia loligo* and *L. vulgaris*. Fabricius gives Greenland, Mohr Iceland, Linné Sweden, Waardenburg Holland, Taslé Brittany, Aucapitaine the Bay of Biscay, Risso and others the Mediterranean, and Stossich Trieste. Steenstrup has renamed our species *L. Forbesii*, distinguishing it from the Mediterranean species by the comparative size of the suckers on the tentacles and arms, these being equal in *L. Forbesii*, and very unequal in *L. vulgaris*. But Krohn has shown that the female of *Rossia dispar* has equal-sized suckers, while in the male they are unequal ; and it is therefore unsafe to depend on this character.

Lister described the anatomy of our species with his usual care. "Ink jet-black" (Johnston, who also mentions a cannibal habit). In the 'Speculum Mundi' it has the name of "Sea-clerk," from its having a knife, pen, and ink ; the Hartlepool fishermen, according to Mr. Hogg, call it "ten-tails." The spawn-clusters have been estimated to contain nearly 40,000 eggs.

This was in all probability the τεῦθος of Aristotle, and undoubtedly the *Loligo magna* of Rondelet.

2. L. ME'DIA*, Linné.

Sepia media, Linn. S. N. p. 1095. *L. media*, F. & H. iv. p. 228, pl. QQQ. f. 1.

BODY tapering below to a point, silvery-grey, almost transparent, with a tint of fleshcolour, and closely speckled with purplish-brown: *fins* rather narrow, inclined to a semicircular shape, placed at a distance varying between $\frac{2}{5}$ and $\frac{1}{4}$ from the tail or extremity: *tentacles* slender, sometimes longer than the rest of the body, but usually $\frac{3}{4}$ of its length; club lanceolate, occupying about $\frac{1}{4}$ of each tentacle; suckers longest in the middle, minute and crowded at the top: *head* short: *eyes* prominent: *arms* unequal in size, the ventral or lowest pair being the largest; suckers irregularly biserial. L. (exc. tent.) 4–5. B. (exc. fins) 0·75.

SHELL resembling a willow-leaf; midrib strong. L. 3·25. B. 0·275.

HABITAT: English, Bristol, St. George's, and North Channels, as well as the German Ocean; Clyde district (Smith and Norman); Peterhead (Peach). Norway to Corunna; Mediterranean and Adriatic.

Usually considered the τευθὶς of Aristotle. It is the *L. parva* of Rondelet and Leach, and *L. subulata* of Lamarck.

The squid described and figured by Forbes and Hanley (iv. p. 230, pl. QQQ. f. 2), from the Irish coasts, as *L. Marmoræ* of Verany appears to be the female of *L. media*. The body is said to be stouter, and the fins to meet at the extremity of the mantle. Verany doubtfully refers this so-called species to *L. media* and *L. subulata*.

Dr. Rose, in the 'Zoologist' for 1853 (p. 3864), has recorded the occurrence of *Onychoteuthis Banksii* at Banff. This genus has the tentacular club armed with hook-like cups, besides suckers at their base. The species being a native of the Indian Ocean, judgment must be reserved as to its British habitat.

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* Intermediate in size, viz. between *L. vulgaris* and *Sepiola Rondeleti*.

†† Body short: *fins* semicircular, widely separated, and wing-like: *sucker-cups* having the edges of their rings smooth.

Genus III. RO'SSIA*, Owen. Pl. VI. f. 1.

Body oval: *mantle* more or less globular; its edges are free all round, and not united with the head by a ligament: *fins* small, placed behind on the middle of the sides: *eyes* covered by a tegumentary lid, with a small opening: *arms* in unequal pairs.

Shell lanceolate, shorter than the mantle.

Woodward made this a subgenus of *Sepiola*. The difference consists in that genus having its mantle united with the head by a ligament on the back.

1. Rossia macroso'ma†, Delle Chiaje.

Sepiola macrosoma, D. Ch. Mem. iv. t. lxxi. *R. macrosoma*, F. & H. iv. p. 222, pl. NNN. f. 1.

Body smooth, fleshcolour, irregularly covered with minute purple specks: *mantle* semioblong: *fins* attached throughout at the base: *tentacles* worm-like and slender, as long as the head and mantle together; club crested on each side, and bearing extremely numerous and crowded minute suckers on the inner or lower surface: *head* short and broad: *eyes* large and prominent: *arms* lanceolate, the two lower pairs being the largest; all except the ventral pair are interwebbed at their bases; suckers globular, on long stalks, diminishing in size towards the tips of the arms, and irregularly disposed in 3 or 4 rows. L. (exc. tent.) 2·5–3. B. (exc. fins) 1.

Shell slightly expanding towards the point. L. 1·5. B. 0·4.

Habitat: Dublin Bay (Ball and Kinahan); estuaries of the Dee and Mersey (Collingwood); Isle of Wight (Saxby, *fide* F. & H.); Aberdeenshire (coll. Macgillivray); Hebrides and Shetland, in 40–75 f. (J. G. J.). It is rare or not often met with. Bohuslän (Lovén, as *R. Owenii*); Mediterranean (D. Chiaje, Risso, Philippi, and Verany).

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* After Sir John Ross, the arctic navigator.

† Having a large body.

Steenstrup, who is one of the greatest authorities on the Cephalopods, considers *R. Owenii* of Ball the male, and his *R. Jacobii* the female of *R. macrosoma.* Ball described *R. Owenii* as having the arm-suckers very large and distinct, and like "pearls in a diadem;" they are ranged in 3 rows (oblique rows of 3 or 4, F. & H.), those in the centre row being not more than half the diameter of those on each side; on the first pair of arms the suckers are more numerous, more equal in size, and smaller than on the other arms. He described *R. Jacobii* as much larger, its suckers smaller, and its arms proportionally shorter.

A small Cephalopod of this genus, which I dredged in Shetland, having longer and more slender tentacles, with the club at the extremity only, and the arm-suckers symmetrically arranged in a double row, Prof. Lovén says "may very possibly be the young of my *Rossia glaucopis.*" This species was discovered by him in Finmark, and has since been found by Sars on the same coast in 20 f.

2. R. PAPILLI'FERA*, Jeffreys.

BODY stout, and of a more solid consistence than that of the foregoing species; the back of the mantle, head, and arms is covered with small whitish pimples, which are mostly placed on the chromatophores, and irregularly scattered over the surface; these pimples are more numerous and smaller on the upper part of the body; colour pinkish-grey, with the usual purple spots, which on the back of the mantle or sac are somewhat elongated and inclined to be linear; the ventral or under side and the outer edges of the fins are of a much paler tint: *mantle* roundish-oval, truncated above: *fins* proportionally small, attached throughout at the base: *tentacles* rather thick, not extending below the middle of the mantle; club terminal and small, crested on each side, and furnished with small and numerous but not crowded suckers: *funnel* short, very broad at the base: *head* large and broad: *eyes* not very prominent, having a thick and wrinkled lid: *arms* stout; the second pair, on the ventral side, the largest; all except the ventral pair are connected below by a strong web; suckers bead-like, each supported by a short pedicle; they are larger on the lower part and in the middle of each arm, and become very small at the tips; the mode of arrangement is biserial, each row occupying one side only of the under part, the middle being smooth. L. 1·75. B. 0·875.

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* Covered with pimples.

HABITAT: North of Shetland; an apparently adult specimen from 90–100 f., and another very young one from 60–80 f. I have not described the shell, from a dislike to mutilate the typical specimen.

Notwithstanding the extremely active habits of this class, my largest specimen bears a colony of a minute species of *Tubularia* (probably new, or at least undescribed by Mr. Hincks), with a smooth and simple stalk, which had deeply implanted itself in the head, near the right eye and at the base of the other.

Genus IV. SEPI'OLA*, Rondelet. Pl. VI. f. 2.

BODY oval: *mantle* globose; its dorsal or hinder edge is connected in the middle with the head by a broad ligament: *fins* small, placed as in *Rossia*, but thinner: *eyes* partly covered by a cuticle or lid: *arms* in unequal pairs.

SHELL small, bat-shaped.

These pretty little cuttlefishes frequent shallower water than their cousins the *Rossiæ*.

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* Diminutive of *Sepia*.

SEPIOLA RONDELE'TI*, (*Rondeletii*) Leach.

S. Rondeletii, Leach, Zool. Misc. iii. p. 140; F. & H. iv. p. 220, pl. MMM. f. 2 (as *S. Atlantica*) and f. 3.

BODY smooth, fleshcolour, with irregular blotches and spots of dark purple; underside of a paler hue; the reflected edges of the mantle, as well as the funnel, outer part of the fins, and the inner sides of the tentacles and arms are yellowish-white: *mantle* semioval or bell-shaped: *fins* leaf-like, proportionally large, somewhat angulated at the top: *tentacles* vermiform, in the male nearly twice as long as the head and mantle together; in the female not above $\frac{1}{3}$ of that length; club crested outside, and closely studded underneath with very minute equal-sized suckers: *funnel* small: *head* large: *eyes* prominent; "iris black, conjunctiva white" (Johnston): *arms* short, the second ventral pair largest; suckers regularly arranged in 2 rows, the largest in the middle; in the female they are crowded and 4-ranked on the tips of the lowest or ventral pair of arms. L. 1·25–1·5. B. 0·625–0·75.

SHELL thin.

HABITAT: Every part of the British coasts, from Shetland (Maclaurin) to Cornwall (Cocks and Laughrin). It is not unfrequently caught in shrimp-nets; Forbes and Hanley give a depth of from 7 to 20 f. among the Hebrides. Greenland (Holböll, *fide* Steenstrup) to the Ægean (Forbes).

Mr. Alder's account is amusing:—"This is an odd fish, crouching generally at the bottom like a toad, with its great goggle eyes half-closed, and sometimes crawling along by means of its suckers, puffing the water through the funnel all the time. When it does take to swimming, it darts very quickly through the water, and is difficult to catch. When taken out of the water and placed on the hand, it had recourse to an odd mode of progression, turning two or three somersets in tumblerfashion, first laying hold with its arms, turning over, and laying hold again until it managed to get back into the water." According to Mr. Gosse ('Zoologist' for 1853), it burrows in the sand by blowing through its funnel and using its arms with their sucking-disks to remove small stones and gravel. He also saw it eject several times in succession a jet of inky fluid; but apparently not for the purpose of concealment, because the matter did not diffuse itself in the water, but remained in a coagulated state, and when moved with a stick was drawn into slimy strings. I am informed by Mr. Laughrin that some spawn which he hatched rose to the surface as they came out, and continued there for some time before they went to the bottom. This reminds one of the observations of G. O. Sars as to the fry of the codfish. Bouchard-Chantereaux has given some particulars of the spawn of *S. Rondeleti.* It is deposited towards the end of May and beginning of June, in the form of a bluish gelatinous mass, in the centre of which the eggs are arranged as if around an axis. Each mass contains from 40 to 130 eggs. The female produces from 15 to 36 spawn-masses; and these are united at their base by an amorphous glutinous stalk which is attached to submarine bodies. The fry is hatched in from 22 to 25 days. Mr. Alder noticed the instantaneous change of colour in newly hatched individuals, "becoming red or white alternately several times during the day"; and Forbes mentions a Skye specimen being always pale when put in a dark place.

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* From Rondelet, a French physician and naturalist.

The "calamaretto" and "seppietta" of the Italians, and one of the most esteemed "frutti di mare" in the Mediterranean and Adriatic. It is the *Sepia sepiola* of Linné, and *Sepiola vulgaris* of Grant. The male is *Sepiola Atlantica* of D'Orbigny.

Family II. SEPI′IDÆ, (*Sepidæ*) D'Orbigny.

Body oval, compressed: *mantle* shield-like, edged nearly throughout its length on each side by a narrow fin: *head* united behind to the mantle by a triangular muscle: *eyes* provided with a lid.

Shell (sometimes called "bone") elliptical, solid, formed of numerous horizontal layers, which are interconnected by innumerable minute perpendicular laminæ, making the structure cellular or honeycomb-like; it is margined by a cartilaginous membrane, and armed at the lower end with a spike or crest.

The only known genus is

SE′PIA*, Pliny. Pl. VI. f. 3.

1. Sepia officina′lis†, Linné.

S. officinalis, Linn. S. N. p. 1095; F. & H. iv. p. 238, pl. OOO, and (shell) pl. PPP. f. 1.

Body broad, smooth or slightly tubercled on the back, of beautiful and various colours, usually brown striped across with white in a bifurcating fashion, like a zebra, and covered with irregular purplish chromatophores and white specks; the ventral area is paler, and the chromatophores are larger and more distinct: *fins* thin, nearly equal in breadth; they are interrupted near the base: *tentacles* very long; club expanded at the sides into a plaited flounce, and bearing underneath several rows of unequal-sized suckers, those in the centre being large and few, and the terminal ones minute and numerous: *head* comparatively narrow: *eyes* prominent and black: *arms* rather short, stout, lanceolate, and subcarinated; their edges are fringed by a membrane, and the fourth (or ventral) pair is crested; suckers in 4 rows, equal and regular, but rather small, globular, stalked, and having simple hoops (F. & H.). L. 12. B. 6.

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* Σηπία, Aristotle.

† Used for medicinal and other purposes.

Shell oblong (broadly lanceolate without the cartilaginous fringe), white except on the back or outer side, which is faintly tinted with fleshcolour; it is hard and closely corrugated like sealskin on the back, where it is divided down the middle by an indistinct ridge, which widens towards the front and has a slight furrow on each side; under or inner side soft, raised in the centre, from which there is a gradual slope towards the front, and excavated towards the other end, so as to expose the successive layers of growth; the surface of the raised portion is microscopically fretted; that of the excavated portion is marked with a few slight and irregular longitudinal lines, and is of a silvery and somewhat iridescent hue: *cartilaginous fringe* or margin glossy, narrow and nearly equal in width in front and on each side, but gradually becoming wider and expanding towards the other end, where it is very broad and raised like a ledge: *apophysis* spike-shaped and short, connected with the main fabric by a series of close-set fibrous lines; it is proportionally more prominent in young than in adult specimens. L. 8–9. B. 3–4.

Habitat: Aberdeenshire to Cornwall; generally distributed. Norway (Müller and others) to the Ægean (Forbes).

Pierius, in his 'Hieroglyphica,' gives the *Sepia* a bad character, representing it as the symbol of lying, wickedness, letters, the slippery love of woman, and weather. Its pigment is said by Persius to have been used as ink; and its shell (the *σήπιον* of Aristotle) was formerly in great vogue for medicinal and various other purposes. When pounded it makes a tolerable dentifrice; and pieces are sometimes put into the cages of singing-birds to sharpen their beaks. Cantraine states that this cuttlefish was shot with arrows in the summer at Messina.

I have a shell of *S. Fillouxi*, Lafont., in Mr. Clark's Exmouth collection. It is proportionally shorter, and broader (especially towards the base), than the shell of *S. officinalis*, and is much flatter on the underside; the excavated portion extends over ⅔ of that side, and the layers are more remote; the cartilaginous hood at the base is larger and deeper, and the spike is smaller and less conspicuous. This species inhabits the northern and western coasts of France.

2. S. E'LEGANS*, De Blainville.

S. elegans, De Blainv. Dict. Sc. Nat. t. lxviii. p. 44, and Faune Franç. livr. 18. p. 19, pl. 3 A. f. 2.

BODY bluish-brown, with small transverse white lines and a marginal row of white dots on the back; underside dirty white speckled with red: *mantle* oval, depressed, terminating at the base in a small point in the middle, which represents the beak of the shell: *fins* or swimming-organs narrow in front and enlarging towards the base, where they are disunited: *tentacles* ⅕ longer than the ventral portion of the body and the head taken together: *arms* having 4 rows of pedunculated suckers; ventral or lowest pair the largest (De Blainville).

SHELL boat-shaped; it is much smaller, narrower, and more slender than in the first species; the back is deeply tinged with fleshcolour, the cartilaginous margin on the upperside being tinted with yellow; the corrugation is more delicate and not so distinct; instead of the medial ridge there are several slight furrows, of which 2 or 3 are more conspicuous than the rest; the underside is scarcely raised in the centre, and the excavated portion is more strongly lineated; the cartilaginous fringe is not so disproportionately broad at the base; apophysis or beak longer, more prominent, and triangular instead of rounded. L. 4. B. 1·25.

HABITAT: Oxwich Bay, near Swansea (J. G. J.), and Guernsey (F. C. Lukis); one entire shell and the greater part of another. North and North-west of France (De Blainville and others); Genoa (Verany); Algiers (Aucapitaine).

S. Orbignyana of Férussac.

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* Elegant.

3. S. BISERIA'LIS*, (*bisserialis*) De Montfort.

S. bisserialis, (De Montfort) Verany, Moll. Méd. i. p. 75, pl. 26; F. & H. iv. p. 241, (shell) pl. PPP. f. 2.

BODY oblong, of a delicate greyish-pink colour, closely covered with minute purplish-brown chromatophores or pigment-spots of various shapes and sizes; those on the underside or belly are larger and more scattered, the spots on the upperside or back being smaller and very crowded: *mantle* tough, with a membranous outer skin: *fins* equal in width, extending from a little below the upper edge of the mantle to near the base: *tentacles* exceeding in length the mantle and head together; stalks slender and smooth; club very small, marked obliquely on the outer side with rows of purplish-brown specks, and irregularly studded underneath with small suckers, besides 2 or 3 much larger ones at the base of the club; the pedicles of the suckers are long: *funnel* conical and wide: *head* large, broadly triangular: *eyes* prominent, resembling those of a fish: *arms* short and thick, the ventral or lowest pair by far the largest; arm-suckers irregularly arranged, some of the arms (especially in certain specimens) having 2 either symmetrical or alternate rows, while other arms in the same specimens have 3 of such rows; these suckers are nearly equal in size from the base until they approach the tips, where they become minute and crowded; all the arms, except the ventral pair, are slightly webbed at the base. L. (exc. tent.) 3. B. 1·5.

SHELL narrowly lanceolate and very slender; back or upperside firm, of a delicate rosy fleshcolour, its margin being covered with a broad and thin yellowish epidermis; this side is slightly shagreened, and exhibits all the layers of growth, of which more than 100 may be counted; the medial ridge is distinct and narrow throughout; underside soft, white, raised at about $\frac{1}{3}$ of the distance from the front, to which it slopes; the excavated part occupies the remaining $\frac{2}{3}$; this part is of a silvery hue, and is marked down the middle by a distinct furrow, besides several slight longitudinal lines; the excavated part is furnished at the sides with a slender rib, which forms a curve at the base; the whole surface of the underside is microscopically fretted: *cartilaginous fringe* narrow and thin on the upper part, much broader and raised like the sides of a boat on the lower part, and forming an abruptly defined and regular hood at the base: *apophysis* crest-shaped, not projecting beyond the base, consisting of a slight and sharp ridge for about a quarter of an inch at the back, and elevated at the base into an irregular and jagged prominence, which in some specimens extends to the top of the cartilaginous hood. L. 2·5. B. 0·9.

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* In two rows; from the arrangement of the arm-suckers.

HABITAT: Polperro (Laughrin); shells only on sandy beaches at Mawgan Porth in Cornwall, and Oxwich Bay near Swansea (J. G. J.), Guernsey (F. C. Lukis), Northumberland (Alder), and Magilligan in Derry county (Hyndman). It has consequently a rather extensive range. North-west of France (D'Orbigny père and others); Mediterranean and Adriatic (Philippi and Verany).

It appears to be the *S. elegans* of Férussac and D'Orbigny (but not of De Blainville), and perhaps also their *S. rupellaria,* as well as the *S. rubens* of Philippi.

B. *OCTO'CERA,* De Blainville. *Octopoda,* Leach.

Mantle globular or oval, symmetrical, and usually not expanded on either side: the ventral portion is small in comparison with the rest of the body: *arms* 8, webbed at the base; suckers sessile, not pedunculated, nor having a horny ring: *gills* attached by the stalk only.

SHELL none, except in the genus *Argonauta,* where (in the female only) it is external and forms a single involute chamber.

Family III. OCTO'PIDÆ, D'Orbigny.

Mantle attached to the neck, without fins or lateral expansions.

Genus I. OCTO'PUS*, Lamarck. Pl. VII. f. 1.

Arm-suckers arranged in two rows.

The famous Πολύπους or *Polypus* of classical writers; its suckers (κοτυληδόνες) are even mentioned in the Odyssey. According to ancient moralists it typified a flatterer, an avaricious man, a miser, the devil, a lecher, a bad woman, a cheat, and an obstinate person. Numerous proverbs, epigrams, and epithets were illustrated by its well-known ways and habits; and it was represented in coins of Syracuse and Tarentum. Swan, in his 'Speculum Mundi' (1643), says, "Polypus is a fish with many feet and a round head unto them; it is a great enemy to the Lobster: and (as Ælian and other authors write) they can often change their colour, and by that project devoure other fishes. Their use and custome is to lie lurking closely by the sides and roots of rocks changing themselves into the colour of the same thing unto which they cleave: insomuch that they seem as a parcel of the rock: whither when the foolish fish swim, they fall into danger: for whilst they dread nothing, these Polypodes suddenly prey upon them and devoure them. And indeed this is the constancie of unfeared treacherie, which is often found in many men, who will be anything for their own ends, and nothing without them: sparing none for their own purposes nor loving any but to effect them. Their heads indeed may well be near their feet: for they prize the trash we trample on farre above the joyes of heaven; else would they never work their fond purposes by deceitful means, and damage others to help themselves."

The genus *Polypus* of Schneider; but Leach seems to be the only modern naturalist who has adopted that name.

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* Having eight feet.

OCTOPUS VULGA'RIS*, Lamarck.

O. vulgaris, Lam. Mém. Soc. H. N. p. 18; F. & H. iv. p. 209, pl. NNN. f. 2.

BODY of a dusky hue, purplish-brown, reddish-yellow, or grey variegated with white; the back is covered with orange and brown spots or chromatophores, and the whole surface with countless minute purplish specks; the back is also more or less tuberculous or warty: *funnel* wide: *head* not large in proportion to the rest of the body: *eyes* globular and prominent: *arms* stout, very long, gradually tapering to a fine point, equidistant, but unequal, the dorsal pair being the smallest: *suckers* extending the whole of the underside, diminishing in size to the extremities of the arms; I counted 2112 in one specimen; the intermediate web is thick, and forms a crest on one side of each arm. L. (exc. brach.) 6; br. 24. B. 2.

HABITAT: Laminarian zone on the southern coasts of England; Liverpool (Collingwood); dredged in Lamlash Bay, N. B. (Wyville Thomson); Firth of Forth (Grant); Irish coasts, "not uncommon" (Templeton, *fide* Thompson). But *Eledone cirrosa* may have been in many cases mistaken for this species. *O. vulgaris* occurs all along the northern and north-western coasts of France, and in the Mediterranean and Adriatic; Canaries (Verany); ?Haiti, Cuba, Bahia, Mauritius, Indian Ocean, and Red Sea (D'Orbigny).

I have represented it in the frontispiece of this volume as the "pieuvre" of the French, patiently watching for its prey, with its cold grey merciless eyes and its almost fiendish expression. Its anatomy was given by Cuvier in his usual felicitous style. Mr. J. F. Marshall fully confirms the observation made by Aristotle that it feeds chiefly on bivalves. The heaps of shells round their dens, which are uncovered during the recess of spring tides at Herm, is enormous; in one of these heaps he counted more than 2000 shells, half of which were *Tapes pullastra,* and the other half *T. virgineus,* with a few *T. aureus* and *Psammobia vespertina.* The pieuvres are used in France as a bait for conger eels; and, according to Bouchard-Chantereaux, they are caught at neap tides with a piece of dogfish, and dragged out of their holes at low water of spring tides with a pole-hook. Cantraine says the *Octopus* is dreaded by the Italian divers and bathers. The water is admitted freely to the gills through a large opening between the mantle and the head on the underside, and is expelled through the funnel. When this creature is at rest, the respiration is regular and resembles the action of a pair of bellows.

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* Common.

It is the *Sepia octopodia* of Linné, and *Polypus antiquorum* of Leach. *O. tuberculatus* of De Blainville is apparently a mere variety.

Genus II. ELEDO′NE*, Leach. Pl. VII. f. 2.

Arm-suckers arranged in a single row.

Aristotle, in his History of Animals (Δ. β. 15), distinguished this kind from *Octopus* (πολύπους) by the above character. The difference between them is, perhaps, not less than that which separates *Ommatostrephes* from *Loligo.*

Menke, Steenstrup, and Mörch have spelt the name *Heledone,* supposing that the first letter was aspirated; Gaza and Clark give *Eledona.*

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* Ἐλεδώνη, Aristotle.

ELEDONE CIRRO'SA*, Lamarck.

Octopus cirrhosus, Lam. Mém. Soc. H. N. p. 21, pl. 1. f. 2 *a*, *b*. *E. cirrhosus* F. & H. iv. p. 211, pl. KKK. f. 4, and pl. MMM. f. 1.

BODY oval, contracted below the eyes, and rounded at the base; it is smooth or minutely granulated on the back, which is slightly convex; colouring clouded, and closely sprinkled over with small reddish-brown dots; sides rounded, of a lighter colour, and dotted; belly flattened, bluish-white, and also sprinkled with dots, which, however, are larger, more distant, and arranged in almost regular lines: *eyes* rather small, of a beautiful orangecolour, resembling those of the toad, often concealed by the skin being drawn over them; eyelids white and silvery, profusely dotted: *arms* fully one half longer than the rest of the body, finely tapered, connected together at their base by a membrane, which runs up the outer edge, giving each arm a winged appearance; suckers uniserial, large, saucer-shaped, with a central hole annulated on the rim, the rim being plaited in a radiating manner; towards the base of the arm they are longer and not in contact; but they soon become approximate, and (gradually lessening in size) are very minute at the tips; there are about 100 on each arm. (Johnston). L. (exc. brach.) 4–6; br. 10–12. B. 3–4.

HABITAT: Not uncommon on the coasts of Scotland, Ireland, and the north of England, in rather deep water; Shetland (Maclaurin); Cheshire (Collingwood); Devon (Montagu); Falmouth (Cocks). Norway and Sweden (Müller, Ström, and Lovén); Faroe Isles (Sysselman Müller, *fide* Steenstrup).

Ström says it was called "Suar" by the Bergen folk, and that it sticks so fast to fishes as to be often taken with them. "When at rest, this Octopod lies prone on the belly, the arms spread out in front, with their extremities disposed in spirals on the sides. It has in this position a considerable likeness to a toad; and, often raising the back and head, its aspect is really repulsive and threatening. The changes of colour from reddish-brown to a dull greyish-white, frequently clouded or spotted with different shades, are made with remarkable velocity, and without any obvious cause. * * * * It moves quickly, and always retrograde, playing its arms in a regulated graceful manner, which no one can contemplate without wonder in a body so grotesque and apparently so inapt for locomotion. When it swims, the arms are all drawn together and lanced straight out from the head in a column, the body being thus by successive strokes driven backwards." (Johnston, in Proc. Berw. N. H. Club, i. p. 198.) This graphic description of its appearance and habits will serve for all the family.

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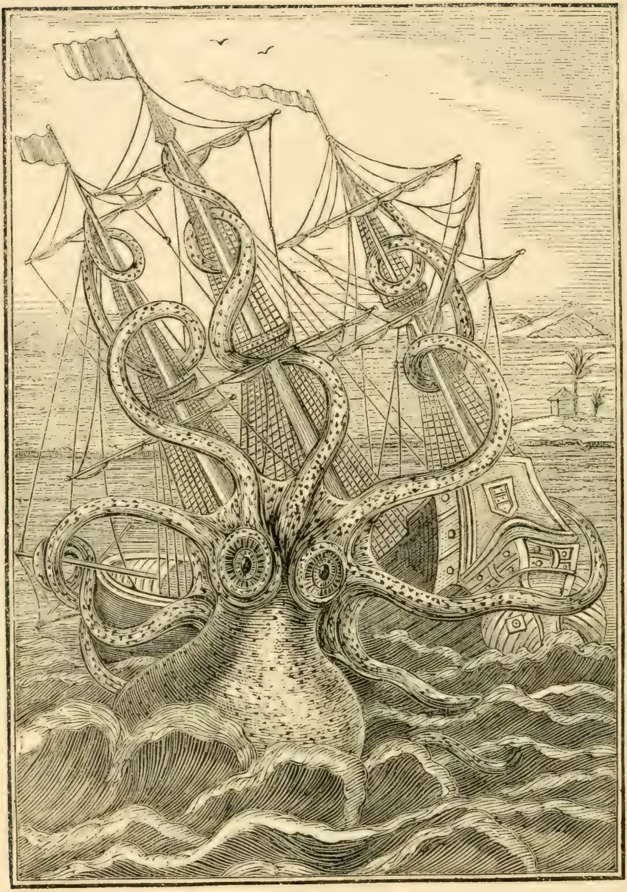
* Curled.

The specific name appears to have originated in the arms being curled. It is the *Sepia octopodia* of Pennant (but not of Linné), *Octopus ventricosus* of Grant, and *E. Pennantii* of Forbes; *E. Aldrovandi* of Macgillivray (not of Delle Chiaje) is probably the male.

The only exotic species of this group which has been observed in our seas is the *Spirula australis* of Bruguière or *S. Peronii* of Lamarck. Empty shells have been found on nearly every part of the British coasts, from Shetland to the Land's End, as well as in the Faroe Isles and in the north-west of France, and at Gibraltar, Malaga, Algiers, the Canaries, Azores, and Nantucket. Its home is the Caribbean Sea and more southern latitudes, whence the Gulf-stream or Equatorial current transports this with other floating intertropical products to the Bay of Biscay; and from that point they are drifted northwards by the prevalent winds.



Le poulpe colossal.

SUPPLEMENT.

So many new treatises in different languages and such a mass of fresh observations have incessantly poured in upon me since the first volume of this work appeared (now seven years ago), that another volume would scarcely suffice for the additions, corrections, and explanatory remarks which I have noted in my interleaved set of the volumes already published. I must therefore endeavour to compress these notes into the smallest possible compass; and I hope my numerous correspondents will pardon me if I do not give all the valuable information which they have kindly contributed. My critics will perhaps not be offended by my silence. But as to two of them—and I say it in the most friendly spirit—I would recommend Professor Römer to compare a sufficient number of specimens from the Atlantic and Mediterranean before he again asserts positively that *Tapes geographicus* and *T. pullastra* are not the same species; and if Herr Weinkauff would consult the original work of Da Costa, he would find that *Donax vittatus* and other species were really described by him in the strict Linnean method. In order to save space, the letter E will denote exotic or extra-British habitats, and F the localities for upper tertiary or quaternary fossils.

Vol. I. Introduction, p. xxv, line 6 from bottom, for "three millions" read "one million."

P. xxxii, l. 17 from top, for "foot" r. "rood.

P. xxxvi, *Aplysia* is not a Nudibranch.

P. xxxix, l. 14 from bottom, after "chalk" add "and gneiss."

P. xlii, l. 3 from top, for "marble" r. "bronze."

P. lxxxii, last l., for "*ebenus*" r. "*lutescens*."

P. cii, l. 6 from top, for "Lilljeborg" r. "Lovén"; and l. 7, for "Denmark" r. "Sweden."

P. cxi, l. 10 from bottom, for "*nodiferus*" r. "*nodifer*"; and add "*Lepton sulcatulum* and *Rissoa lactea*."

P. 1.—SPHÆRIIDÆ. The cylinder is placed at the shorter end, and not on the same side as the ligament—this being contrary to the usual position of the tubes in the Conchifera.

P. 5.—SPHÆRIUM CORNEUM. E. Siberia (Gerstfeldt). Var. *Scaldiana*. Many places. E. Wisby, Sweden (Lindström, as *Cyclas lacustris* of Nilsson). *C. flavescens*, Macgillivray. Var. *pisidioides*. A form approaching this variety has been taken by Mr. Jordan near Bath, and by Mr. Nelson near Birmingham. Mr. Rich found a monstrosity of the variety, having the lower tube divided or forked.

P. 7.—S. RIVICOLA. Near Bath (Daniel). E. Russia (Jelski); Denmark (Poulsen).

P. 8.—S. OVALE. Wakefield (Lumb, *fide* Harting).

P. 10.—S. LACUSTRE. Near Glasgow (Purdie). F. Barnwell, Cambridgeshire (A. Bell).

P. 20.—PISIDIUM AMNICUM. F. Forest Bed, Norfolk (Lyell and others). Syn. *Cyclas palustris*, Drap., and *C. obliqua*, Lam.

P. 20.—P. FONTINALE. E. Algeria (Bourguignat). Var. *Henslowana*. F. Marine glacial deposit near Christiania (Crosskey and Robertson).

P. 23.—P. PUSILLUM. E. Greenland (Möller, as *Cyclas Steenbuchii*); Sicily (Benoit); Algeria (Bourguignat).

P. 25.—P. NITIDUM. F. Forest Bed (A. Bell). E. Southern range as in last.

P. 32.—UNIO TUMIDUS. E. Russia (Jelski).

P. 34.—U. PICTORUM. E. Siberia (Gerstfeldt and others); Algeria (Bourguignat).

P. 37.—U. MARGARITIFER. E. Amoorland (Schrenck); Spain (Graells); probably also North-American, as *Alasmodonta arcuata* of Barnes. A modern concordance of the Mollusca inhabiting the two continents would be very useful and interesting. It might tend to reduce the excessive number of species in this family made by our Transatlantic cousins.

P. 41.—ANODONTA CYGNEA. E. Naples (Poli).

P. 43.—A. ANATINA. E. Turkey (Bourguignat).

P. 47.—DREISSENA POLYMORPHA. E. Denmark (Poulsen); S. France (Moitessier and others); Scutari (Walderdorff). It is the *Mytilus Wolgæ*, Chemn., and has several other synonyms.

P. 53.—NERITINA FLUVIATILIS. Russia (Jelski).

P. 56.—PALUDINA CONTECTA. F. Forest Bed (A. Bell). E. Spain (Asso, *fide* Graells). Var. *virescens*. Bandless and of a pale greenish colour. Brigg, Lincolnshire (Mr. Thos. Ball). The fry are easily distinguishable from those of *P. vivipara*.

P. 58.—P. VIVIPARA. F. Mewe, near Königsberg (Behrendt). E. Caspian Sea; probably brought down the Volga (Dunker).

P. 59.—BYTHINIA. Qu. BITHYNIA, a province of Asia Minor.

P. 60.—B. TENTACULATA. F. Vesuvius (Guiscardi). E. Greenland (E. v. Martens). Animal in winter of a yellowish chestnut-colour (Daniel).

P. 61.—B. LEACHII. Siberia (Middendorff, as *Paludina Kickxii* of Westendorp); Amoorland (Schrenck).

P. 63.—HYDROBIA. The name of the genus of Coleoptera is *Hydrobius*. *Paludinella* of L. Pfeiffer is a synonym of *Assiminea*.

P. 64.—H. SIMILIS. Foot double-edged in front. Var. *candida*. Shell white. Woolwich (A. Bell). E. Denmark (Mörch) to Madeira (Watson and others); Algeria (Morelet); Malta (Issel). *Bythinia Baudoniana*, Gassies.

P. 66.—H. VENTROSA. Orkneys (Thomas). F. Norwich Crag at Bramerton (coll. Wood); Pisa (Manzoni); ? Vienna basin (Hörnes). E. Denmark, Germany, Spain, Italy, Corsica, and Dalmatia. Synonyms endless. *Turbo stagnalis* of Baster is *H. ulvæ*; Gmelin misquoted him and changed the specific name to *stagnorum*.

P. 72.—VALVATA PISCINALIS. E. Epirus (Mousson). Var. *depressa.* Sicily (Pirajno). *V. antiqua* lives in Jutland and Sweden.

P. 74.—V. CRISTATA. F. Monte Mario (Rigacci). E. Sicily (Pirajno).

P. 76, l. 5 from bottom, before "*Melampus*" insert "*Assiminea.*"

P. 79.—PLANORBIS LINEATUS. E. Siberia and Amoorland (Gerstfeldt); Friuli (Pirona).

P. 81.—P. NITIDUS. In Müller's own collection at Copenhagen specimens of this and the last species are intermixed, and are named in his handwriting "*P. nitidus.*" I am now inclined to consider this the *Helix complanata* of Linné; but it may be more convenient to continue the error than to make so many resulting changes. It is the *H. fontana* of Lightfoot. *P. riparius* of Westerlund is a small variety.

P. 82.—P. NAUTILEUS. E. Sicily (Pirajno). *Nautilus crista,* Linné (Syst. Nat. ed. 10), and *P. imbricatus,* Müller.

P. 83.—P. ALBUS, var. *Draparnaldi.* Birmingham (Nelson). E. Sweden (Westerlund, as a distinct species). *P. Crosseanus* Bourguignat. Middendorff considers this species identical with *P. hirsutus* of Gould from North America. *P. hispidus,* Schröter and Draparnaud.

P. 85.—P. GLABER. E. Greenland (Möller, as *P. arcticus*); and probably Siberia (Dunker, as *P. sibiricus*).

P. 89.—P. CARINATUS. E. Amoorland (Gerstfeldt); Epirus (Mousson).

P. 91.—P. COMPLANATUS. F. Forest Bed (A. Bell). Var. *albina.* Clevedon (Miss Jellie). E. N.E. and N.W. France (Barbié and others).

P. 96.—PHYSA HYPNORUM. E. Pisa (Gentiluomo). Pierces the shells of other individuals, and feeds on them (Dixon).

P. 98.—P. FONTINALIS. E. Amoorland to Madeira and the Canaries. Var. *curta*=*Planorbis gelatinus,* Müll.

P. 102.—LIMNÆA GLUTINOSA. E. Lapland—Beyrout.

P. 103.—L. INVOLUTA. Dr. W. Hill Evans ('Naturalist,' Nov. 1864) says that he "never could discover any portion of the mantle expanded over the shell."

P. 104.—L. PEREGRA. Var. *Burnetti.* In the stomach of a gillaroo trout caught in a lake in co. Tipperary (Walker). Var. *sinistrorsa.* Pond near Balta; a single specimen (Waller).

P. 108.—L. AURICULARIA. E. Sicily (Calcara). Var. *acuta.* E. Agenais (Gassies, as *L. Trencaleonis*).

P. 111.—L. STAGNALIS. E. Lycia (Forbes); N.E. America (Bell and others).

P. 113.—L. PALUSTRIS. E. Greenland (Möller); U.S. (Haldeman); Vancouver I. (P. Carpenter).

P. 115.—L. TRUNCATULA. E. Lapland (Wallenberg and Nylander) to Greece (Roth); Madeira (R. T. Lowe and others).

P. 117.—L. GLABRA. Westmoreland and Sussex. E. Siberia (Middendorff) to Algeria (Terver).

P. 127.—ARION ATER. Omit Jan Mayen's Isle. Var. *rufa.* Naples (Costa).

P. 127.—A. FLAVUS, Müller (*Limax flavus,* Müll. Verm. Hist. p. 10).

BODY slender and capable of being considerably elongated: *colour* grey, with occasionally a yellow or orange tinge on the shield and sides; the head, tentacles, and neck are purplish or dark grey, and the mantle and shield are minutely speckled with white: *shield* proportionally large, finely granulated: *tentacles* short, nearly smooth; the lower pair are mere tubercles: *eyes* small, placed on the upperside of the bulbs which terminate the larger or upper tentacles: *mantle* wrinkled lengthwise when the slug is crawling, and tuberculous when it is at rest and bunched up: *respiratory opening* on the right side of the shield, about halfway between its front and hinder edges: *tail* angulated: *gland* large: *slime* orange-red. L. 0·3. B. 0·2.

HABITAT: Under leaves and in damp places; widely distributed. E. Denmark (Müller); Sweden (Westerlund).

Active and crawls under water. In captivity feeds greedily on the slime of its companions for want of its usual nourishment, which consists of lichens, fungi, and decaying vegetable matter. As my friend Mr. E. J. Lowe well observed, this is more tender than *A. hortensis,* which is remarkably tough and difficult to crush.

P. 128.—A. HORTENSIS. E. Lapland (Nylander, as *A. fasciatus*); U.S. (Binney and others).

P. 129.—GEOMALACUS, Allman. It is not keeled on the back; I was misled by Forbes and Hanley's description.

P. 129.—G. MACULOSUS. Through the kindness of Dr. Battersby, I have had an opportunity of examining several living specimens of this remarkable slug, which I will now describe.

BODY very extensile, glossy, brown of various shades from dark to olive (occasionally of a whitish colour with black spots), beautifully but irregularly marked on the upper part with numerous spots of pale yellow or sometimes white, the whole surface being covered with extremely minute black and white specks, as if powdered over or of a "pepper-and-salt" mixture; the back is wrinkled lengthwise by close-set rows of oblong tubercles: *shield* finely granulated, like seal-skin: *head* dark grey: *tentacles* short; upper pair conical at the base, minutely granular; bulbs lustrous, truncated at the tips; lower pair very small and button-shaped; both pairs are retractile or reversible and equally sensitive to touch; but neither of them seems to apprehend the presence of external objects, however closely placed, if not in actual contact: *eyes*, none that I could detect, although I carefully examined several individuals by the aid of a Coddington as well as an ordinary magnifying-glass; at first indeed I thought there were eyes, placed on the upper part of the tentacular bulbs; but this appearance was an optical illusion, caused by the convergence of the solar rays through the lens on that part of the bulb, and the same appearance shifted to other parts (1868, Oct. 4. Reexamined for eyes, but could not find any): *respiratory orifice* large, circular, placed on the right-hand side of the animal about halfway between the front of the shield and that part of it where it bends inwards to the rear: *foot* thick and large, brownish-yellow, and striped across at the sides, which somewhat project or shelve outwards; it is squarish in front, and rounded or bluntly pointed behind; sole pale yellowish or light grey, and having for its entire length a rather broad and clear band which runs down the middle: *caudal gland* large: *slime* gelatinous, whitish. L. 2. B. 0·4.

SHELL resembling that of a *Limax*, but of a granular structure, oval or shield-shaped, rather solid, slightly convex above and equally concave underneath, showing concentric and irregular lines of growth: *boss* or nucleus indistinct, placed near the front.

Habitat: Rocks along the shores of Lough Caragh near Killarney, confined to an area of about twenty miles by six. Active. Its mode of creeping is peculiar, being effected by a series of movements like those of the paddles of a water-wheel in a mill, which are perceptible in the slug through the transparent band of the sole; these movements or steps exhibited at any one time are about 15 in number. It withdraws its tentacles separately on each being touched. At first rejected, after at least a week's fasting, some fresh turnip-tops; afterwards a little was eaten. One individual fed on some shreds of raw beef, the others apparently not caring for it. When handled, it rolls itself up like a leech, which it much resembles in appearance. It comes out in the summer and autumn. *G. Andrewsi* of M. Mabille is scarcely a variety.

P. 131.—Limax gagates. E. Spain (Graells); Malta (Mamo); Madeira (R. T. Lowe and others). The front part of the body is very broad and thick. The shield is actually divided into two lobes; the upper lobe is defined by a narrow dark line, of an oval shape, and appears carved out of the hinder part of the shield. This slug, like many of its congeners, is infested by the little mite (*Philodromus limacum*), which feeds on the exudation of the body. The shell has a more square outline than that of the following species; it varies in solidity according to the age of the individual.

P. 132.—L. marginatus, Drap. (not Müller). If it is considered indispensable to insist on the strict law of priority, this specific name must be replaced by *carinatus*, and *arborum* by *marginatus*. Férussac did not describe his *L. Sowerbii*. E. Russia (Jelski); Germany (Gysser, v. Strobel, and others); Pisa (Issel).

P. 133.—L. flavus. E. Sicily (Calcara); Madeira (Baron de Paiva); U.S., in towns, "very probably introduced from Europe" (Tryon); Buenos Ayres (v. Strobel). According to Heynemann, the *Limacus Breckworthianus* of New Zealand.

P. 134.—L. agrestis. E. Greenland (Mörch); Mauritius (Férussac); U.S., as *L. tunicata* of Gould.

P. 135.—L. ARBORUM. E. Sweden (Lindström); Iceland (Steenstrup); Lombardy (v. Strobel). It has several synonyms, and is the type of the genus *Lehmannia* of Heynemann.

P. 137.—L. MAXIMUS. E. Naples (Costa); U.S. (Tryon).

P. 139, for *L. brunneus* substitute L. LÆVIS, Müller (Verm. Hist. p. 1).

BODY slender, glossy, and smooth except the shield, which is corrugated: *colour* uniform, brown of different shades: *shield* large: *tentacles* short: *tail* pinched up: *slime* clear white or colourless, very thin and transparent. L. 0·5. B. 0·1.

SHELL resembling that of *L. agrestis*, but comparatively larger and arched instead of flat: *boss* terminal.

HABITAT: Everywhere in wet places, under stones or pieces of wood and among moss. E. From Denmark to Mont Blanc, Savoy, and the Pyrenees. It is more active and hardy than *L. agrestis*, with which I have found it. When at rest, the posterior half is contracted into a cylindrical form, and might be taken for part of a worm.

P. 139.—L. TENELLUS, Müll. (Verm. Hist. p. 11).

BODY smooth, glossy, and almost transparent: *colour* greenish-white, the shield yellowish, and the tentacles and head black; occasionally marked on each side with an obscure whitish band: *shield* concentrically wrinkled: *slime* viscid, yellowish. L. 0·75. B. 0·25.

SHELL irregularly oval or oblong, of a moderate consistence, somewhat arched, partially tuberculous or beaded, microscopically and closely striated lengthwise: *boss* indistinct, nearly terminal: *margin* rather broad, thin and membranous. L. 0·15. B. 0·1.

HABITAT: North Mavine, Shetland, on stones in a watercourse of a mountain-mill. E. Scandinavia and France.

P. 145.—TESTACELLA HALIOTIDEA. E. Heidelberg (Hamilton, *f.* Gysser); Belgium (Colbeau); Des Cléons and Vannes, Brittany (Cailliaud and Taslé); Dalmatia (v. Schröckinger). In some of these cases perhaps introduced.

P. 147.—T. MAUGEI. Fields near Devizes (Cunningham, *f.* Woodward). E. Des Cléons (Cailliaud); Morbihan (Taslé).

P. 151.—SUCCINEA PUTRIS. Circumpolar and universal.

P. 153.—S. ELEGANS. E. Lapland (Nylander); Lower

Egypt (Henglin, *fide* E. v. Martens). Var. *ochracea*=*S. ochracea*, Betta. L. Pfeiffer, in his great monument of labour (the 'Monographia Heliceorum viventium'), gives *S. elegans*, *S. Pfeifferi*, and *S. ochracea* as different species.

P. 154.—S. OBLONGA. E. Greenland (Möller, as *S. grœnlandica*); Russia (Jelski). *S. humilis* of Drouet and *S. stagnalis* of Gassies appear to be dwarf varieties.

P. 156.—VITRINA PELLUCIDA. E. Greenland (Möller, as *V. angelicæ*); Lapland (Wallenberg); Algeria (J. W. Flower); Epirus (Mousson); Canada (Bell); U.S. (Say and others). *Helix domestica*, Ström.

P. 158.—ZONITES. Syn. *Helicarion*, Beck; *Hyalina*, Gray.

P. 159.—Z. CELLARIUS. E. Azores (Hartung, *fide* Drouet); U.S. (Morse and others). Zoophagous, Spinelli. Not *Helix lucida* of Pulteney, which is more probably *Z. nitidulus*, var. *nitens*.

P. 161.—Z. ALLIARIUS. E. Bergen—Bayonne. Probably *Helix Hammonis* of Ström. Pulsation variable, from 48 to 56 beats per minute.

P. 163.—Z. NITIDULUS. E. Italy and Dalmatia.

P. 164.—Z. PURUS. E. Russia and Italy.

P. 166.—Z. RADIATULUS. E. Russia—Tuscany. Var. Aberdeen (J. G. J.).

P. 167.—Z. NITIDUS. E. Palermo (Calcara); Dalmatia (Brusina).

P. 168.—Z. EXCAVATUS. Perth (Buchanan White); Tunbridge Wells and Aberdeen (J. G. J.).

BODY slender, greyish-white, with 3 or 4 raised lines along the neck: *mantle* closely covered with milk-white specks: *tentacles* divergent; upper pair rather long and cylindrical, coarsely granulated; lower pair short: *foot* thick, obtusely rounded in front, and gradually narrowing behind to an angular or keeled point: *slime* rather copious and iridescent.

P. 170.—L. CRYSTALLINUS. Caithness (Peach). E. Siberia (Gerstfeldt); Malta (Issel).

P. 171.—Z. FULVUS. E. Greenland (Möller, as *Helix Fabricii*); Lapland (Nylander); N. Japan (Schrenck); Michigan, U.S. (Currier).

P. 172.—Helix. Frequent mention of the snail will be found in the writings of the ancients. At one of the suppers recorded by Athenæus the following riddle was proposed, and may be answered by any "Schneckenfreund":—

῾Υλογενὴς, ἀνάκανθος, ἀναίματος, ὑγροκέλευθος.

The snail is one of the creeping things that was in Leviticus reckoned unclean, and forbidden as an article of food. We keep this law better than our continental friends.

P. 174.—H. ruderata. Kamptschatka, N. Japan, S. Russia, and Austria.

P. 174.—H. incarnata. Belgium, Spain, Italy, and Dalmatia.

P. 174.—H. fruticum. F. Barnwell, Cambridgeshire (A. Bell). E. Spain (Graells).

P. 175.—Helix lamellata. Dingwall (Buchanan White); Bonnington, Lanark (J. G. J.).

Body light grey, darker on the head: *tentacles*, upper pair club-shaped. Very shy.

P. 176.—H. aculeata. Moray Firth district (Martin). E. Lapland (Nylander).

P. 177.—H. pomatia. E. Dalmatia (Brusina); Sicily (Calcara).

P. 181.—H. aspersa. E. Malta (Issel); Smyrna (M'Andrew). Acclimatized at Santiago and in Chili. Var. *tenuis*. Agenais (Gassies); Corsica (Susini).

P. 184, l. 13 from bottom. The shells were not given by Pennant in his 'British Zoology' until the 4th edition, in 1777.

P. 185.—H. nemoralis and var. *hortensis*. I have found the two forms living together, but passing one into another. E. Canada (Bell).

P. 192.—H. Cartusiana. F. Butley, Suffolk (A. Bell). E. Asia Minor (Gerstfeldt).

P. 195.—H. rufescens. E. Siberia (Krynicki and others); Burgundy (Barbié, as *H. glabella*); Switzerland (Am Stein, as same); N. Germany (v. Alten, as *H. sylvestris*); Austria (v. Schröckinger); Sicily (Calcara, as *H. glabella*).

P. 196.—H. CONCINNA. E. Denmark (Mörch); Nova Scotia (Willis).

P. 198.—H. HISPIDA. Mr. Dewick found a sinistrorsal specimen in a quaternary deposit near Cambridge. E. Crimea (Krynicki); Azores (Gerstfeldt); U.S., introduced (Tryon).

P. 201.—H. SERICEA. E. Spain (Graells); Venetia (Betta and Martinati); Epirus (Mousson).

P. 202.—H. REVELATA. E. Lower Tyrol (v. Strobel); Boghar, Algeria (Debeaux).

P. 205.—H. FUSCA. Counties of Lanark and Ross (J. G. J.); near Glasgow (Purdie); Kincardine and Aberdeen (coll. Macgillivray). E. Transylvania (Bielz).

P. 207.—H. PISANA. E. Brittany and Rochelle (Mabille); Alexandria (Ehrenberg and others).

P. 210.—H. VIRGATA. E. Madeira (Watson). Var. *sinistrorsa*. New Holland, Lincolnshire (Ball); Llandudno (R. R. Thomas).

P. 216.—H. ERICETORUM. F. Cambridge (Dewick). Nilsson's species is different from this, and allied to *H. caperata*.

P. 218.—H. ROTUNDATA. Var. *alba*. Clevedon near Bristol (Norman); Leeds (Nelson); Perthshire (Buchanan White). This species may be the long-lost *H. gothica* of Linné.

P. 220.—H. RUPESTRIS.—Durness, Sutherland (Peach). Erroneously stated to be Madeiran; nor was the variety found at Clevedon.

P. 223.—H. PYGMÆA. Banff (Edward); Rosshire (Buchanan White). F. Cambridge (Dewick). E. Lapland (Nylander); Madeira (Watson and De Paiva).

P. 224.—H. PULCHELLA. E. Sicily (Pirajno); Algeria (Morelet); Caucasus (Krynicki); Bermuda (Bruce Hutton); Canada (Bell). *H. minuta*, Say.

P. 227.—H. LAPICIDA, var. *albina*. Went Vale, Yorkshire (Hebden); Reigate (Saunders). E. Typ. Spain (Graells); Madeira (Wollaston and others).

P. 229.—H. OBVOLUTA. Up Park, Sussex (Harting). E. Denmark (Poulsen); Spain (Graells); Sicily (Calcara).

P. 231.—BULIMUS. Le Bulin (*Bulinus*) of Adanson was clearly a species of *Physa*. He derived the name from the resemblance of the shell, when floating on the surface of the water, to "une petite bulle d'air transparente."

P. 233.—B. ACUTUS. E. Near Nykjöbing, Jutland; probably introduced (Mörch); Malta (Issel); Alexandria (E. v. Martens).

P. 235.—B. MONTANUS. E. Ural Mountains (Middendorff); Sweden (Zetterstedt); Belgium (Colbeau); S. France (De Brébisson); Catalonia (Graells); Tuscany (Pecchioli, *f.* Gentiluomo).

P. 237.—B. OBSCURUS. E. Algeria (Bourguignat).

P. 243.—PUPA SECALE. E. Capri I. (Philippi); Sicily (Calcara); Madeira (Watson).

P. 245.—P. RINGENS. Banff (Edward); Dingwall (Buchanan White); Cheshire (Webster). L. Pfeiffer does not seem to have known the synonymy of this species.

P. 246.—P. UMBILICATA. E. Madeira (R. T. Lowe and others); S. Abyssinia (Henglin, *f.* E. v. Martens). *P. anconostoma*, Lowe.

P. 249.—P. EMARGINATA. E. U.S., as *P. badia* of Prof. Adams.

P. 253.—VERTIGO ANTIVERTIGO. E. Kiev, Russia (Jelski); Sicily (Calcara and others).

P. 255.—V. MOULINSIANA. F. Cambridge (Dewick). E. Ronneby, Sweden (Westerlund, as *V. modesta* afterwards *V. Lilleborgi*); Lake Fuurso, Denmark (Mörch); Frankfort (Heynemann, as *V. ventrosa*); Berne (Lischke); Tirol (Gredler); Sicily (Benoit).

P. 257.—V. PYGMÆA. E. Lapland (Nylander).

P. 259.—V. ALPESTRIS. E. Amoorland (Schrenck); Sweden (Lindström and others); Bonn (Lischke) Tirol (Gredler).

P. 261.—V. SUBSTRIATA. Banff (Edward); Perth (Buchanan White); Went Vale, Yorkshire (Ashford). E. Denmark (Feddersen and others), and various parts of Germany.

P. 263.—V. PUSILLA. E. Lapland—Sicily.

P. 265.—V. ANGUSTIOR. Milford, Yorkshire (Blackhouse). E. Russia, Sweden, Denmark, Belgium, N. Italy, Transylvania, and Dalmatia. *V. vertigo*, Issel.

P. 268.—V. EDENTULA. E. Dalmatia (Brusina); Madeira

(R. T. Lowe and others, as *Pupa microspora*). Var. *minor*. S. Abyssinia (Henglin, *f.* E. v. Martens).

P. 270.—V. MINUTISSIMA. E. Sicily (Calcara and others); Dalmatia (Brusina). I regard *Pupa costulata* of Nilsson as the toothed variety; it has also a thicker lip. Var. *minor*. Madeira (Watson, as *Pupa linearis* of Lowe).

P. 273.—BALIA PERVERSA. Perthshire specimens, which Dr. Buchanan White kindly sent me, are rather larger than English. He is of opinion that Scotch land shells are on an average larger than English. Viviparous, Rich.

P. 278.—CLAUSILIA. According to Middendorff and Gerstfeldt no species has been found in Siberia.

P. 280.—C. RUGOSA. E. Dalmatia (Brusina). *Turbo bidentatus*, Ström. The young is *Balia Sarsii* of Bourguignat. Var. *dubia*.

BODY greyish-brown with a slight tinge of violet, covered with irregularly shaped tubercles, which are arranged in rows on the back and sides: *head* snout-like: *tentacles*, upper pair light grey, tuberculous, club-shaped and arched, with oval smooth and brownish tips; lower pair very short and conical, dark brown or sootcolour: *eyes* small, black: *foot* long and slender; sole light grey.

Near Ingleborough, Yorkshire; not with the typical form (Dixon). Its foreign distribution is coextensive with that of the latter. Perhaps they may be as distinct as *Bulimus montanus* and *B. obscurus*; but *C. rugosa* and *C. dubia* are connected through several other forms, especially Ziegler's variety *compar* of *C. dubia*. Schmidt has endeavoured (I think, unsuccessfully) to separate *C. nigricans* from *C. rugosa*; his remark as to the variety *anceps* of *C. rugosa* seems to "put him out of court." Viviparous, Rich.

P. 280.—C. PARVULA. Kinver, near Stourbridge; several specimens (Grant Allen). E. Denmark (Mörch).

P. 281.—C. ROLPHII. E. Widely distributed over the Continent, from Norway to the Abruzzi. Viviparous, Rich.

P. 283.—C. BIPLICATA. F. Cambridge (Dewick). E. St. Petersburg (Gerstfeldt); Norway (Sars); Sweden (Westerlund); Denmark (Mörch and J. G. J.). Viviparous, Rich.

P. 284.—C. LAMINATA. Perth (Buchanan White).

P. 286.—C. SOLIDA. Mr. Rich found a single specimen, with *C. laminata*, at Stapleton, near Bristol; I have figured this as well as a Kinver specimen of *C. parvula*. E. S. Sweden (Walmstedt, *f.* Westerlund); Mont Blanc (Payot); Tuscany (Gentiluomo); S. France (Draparnaud and others).

P. 287.—COCHLICOPA. L. Pfeiffer has unaccountably ignored this long-established generic name, and adopted Risso's other name *Ferusacia*. But Risso gave *Helix lubrica* of Müller as the type of *Cochlicopa*; and that name is much older than *Ferusacia* or *Ferussacia*.

P. 290.—C. TRIDENS. Llandudno (R. R. Thomas). E. Belgium (Colbeau); Mont Blanc (Payot).

P. 292.—C. LUBRICA. E. Persia (Marquis James Doria, *f.* Issel); Lapland (Wallenberg); Canada (D'Urban and Bell). *Achatina maderensis* of R. T. Lowe.

P. 297.—ACHATINA ACICULA. E. Cattaro (Waldersdorff).

P. 300.—CARYCHIUM MINIMUM. M. Baudon has observed that it is very fond of decaying animal matter.

P. 302, l. 2 and 3 from top.—The upper part of the spire is incomplete; and the inner convolutions in that part are represented by mere ledges.

P. 304.—CYCLOSTOMA ELEGANS. F. In a tufaceous deposit between Pwll Gwyn and Caerws, Flintshire (Maw). E. Jutland, probably introduced (Mörch); Belgium (Colbeau); Illyria, Istria, and Dalmatia (v. Schröckinger).

P. 308.—ACME LINEATA. E. Kiev, Russia (Jelski); Denmark (Poulsen and Mörch); Sicily (Calcara); Dalmatia (Brusina); Algeria (J. W. Flower, as *A. Lallemanti* of Bourguignat). *Acicula polita*, Hartmann.

P. 312.—Southey mentions the snail in a very uncomplimentary way:—

> "And through the shining ray was seen the track
> Of slimy snail obscene."
>
> (*Vision of the Maid of Orleans.*)

P. 315, l. 20 from top, for "in" r. "through."

P. 316.—The table of geographical and geological distribution requires a few alterations in consequence of the foregoing notices; these alterations can easily be made in the proper columns.

Vol. II. p. 11.—Terebratula cranium. North of Hebrides, 170–650 f. (W. B. Carpenter and Wyville Thomson). I have examined all the Mollusca procured in this important expedition. F. Certainly *T. euthyra* of Philippi, judging from a comparison of one of his typical specimens in the Vienna Museum; Messina (Seguenza); glacial and postglacial deposits in Norway (Sars and others); Uddevalla (Crosskey and Robertson). E. Loffoden I., 300 f. (Sars); coasts of Northern Asia and Japan (A. Adams); outside Vigo Bay, in about 60 f., two small dead specimens (M'Andrew)! I frequently observed this Brachiopod turn round on its stalk (like a vessel swinging at anchor with the tide), apparently in order to improve its position for the purpose of feeding. Does this stalk or byssal plug represent the foot of most Conchifera? The valves, on being touched, close with a snap. The brachial cirri resemble those of *T. caput-serpentis* in shape and flexibility. I could not detect any fringe of tentacles on the edge of the valves in *T. cranium*. It has a loop, although of a peculiar structure. With the able and kind assistance of my friend Dr. W. B. Carpenter, I have lately examined more thoroughly the skeleton or shelly framework. It is formed on the same general plan as that of *Waldheimia australis*; but the loop in *T. cranium* can only be seen when the animal is in its natural place, because the upper portion of the skeleton (which is not unlike a horseshoe in outline) is connected with the lower portion on each side by a slight suture that is easily ruptured. When the animal matter is removed by careful boiling in potash-water, the upper portion of the skeleton becomes separated from the lower portion at or near the bend of the loop on each side where the sutures connect them; and the fixed or permanent part of the framework consists of two scythe-shaped processes or blades, which are attached by their hafts to the hinge-plate. The terminal points in front of the horseshoe piece are furnished near the sutures with a few unequal-sized and irregularly arranged spikes or projecting teeth. The position of the sutures is not constant, the turn of the loop sometimes remaining with the horseshoe piece, sometimes with the longitudinal processes, and being occasionally divided between them; and this difference is now and then exhibited in the two sides of the same specimen. I would remark that the byssal orifice in *Waldheimia* (to which *T. cranium* has been referred by some authors) is circular and entire; in the present species it is semioval and incomplete. *Anomia terebratula* of Linné, and *T. plicata* of Philippson.

P. 14.—T. CAPUT-SERPENTIS. F. Scandinavia (Sars and others); Sicily (Seguenza). E. Norway, 20–300 f. (Sars); Dalmatia (Brusina); Jamaica (Barret, *fide* Davidson); Australia (J. W. Flower)! *T. marginata* and *T. quadrata* of Risso, *f.* Davidson.

P. 17.—Add TEREBRATELLA SPITZBERGENSIS, Davidson (Proc. Zool. Soc. 1852, p. 78). I dredged a fresh and perfect specimen in 90–100 f., about 35 miles N.N.W. of Unst. It is a native of high northern latitudes, and occurs in a fossil state at Uddevalla and Christiania. My specimen was not living; and it may possibly also be a relic of the glacial epoch.

P. 18.—ARGIOPE DECOLLATA. F. S.E. France (Fischer); Rhodes (Mus. Jardin des Plantes)! E. Guetaria, on the Atlantic coasts of Spain, in 80 f. (Hidalgo, as *Terebratula aperta*). *T. ungula*, Philippson, *T. pectiniformis* and perhaps *T. dimidiata*, Costa; not *T. Soldaniana* of Risso.

P. 19.—A. CISTELLULA should be A. LUNIFERA, Philippi (*Terebratula*, afterwards *Orthis*, *lunifera*, Phil. Moll. Sic. i. p. 97, t. vi. f. 16, *a–f*). Orkneys, 35–40 f. (Thomas)! E. Mediterranean, from Corsica (Requien) to Malta (Mamo), and Ægean, 95 f. (Forbes)!

P. 21.—A. CAPSULA. Guernsey, 8–20 f. F. Kirköen, near Christiania (Sars).

P. 22.—MEGERLIA (not TEREBRATELLA) TRUNCATA. E. Croix in Morbihan (Preux, *f.* Taslé); Ile de Noirmoutier in Vendée (Pict, *f.* Fischer); Guetaria, N. Spain (Hidalgo).

P. 23.—RHYNCHONELLA PSITTACEA. In 1867 I dredged two perfect specimens (one full-grown and the other young) off Unst; but they were dead. It is impossible to say whether they are fossil or recent. According to Sars this species lives in Finmark, as far south as Tromsö, in 20–80 f.; "Drontheim" was written by me in mistake for "Tromsö."

P. 24.—CRANIA, Philippson (not Retz).

P. 24.—C. ANOMALA. N. of Hebr., 170–530 f. (C. & T.). Var. *alba.* Shetland (Barlee); N. of Hebr., 189 f. (C. & T.). *Anomia turbinata*, Poli.

P. 30.—ANOMIA EPHIPPIUM and var. *aculeata.* E. Labrador (Packard); Canada (Bell); State of Maine (Mighels).

P. 34.—A. PATELLIFORMIS. E. Norway, shore—50 f. (Sars).

P. 38.—OSTREA EDULIS. In England "oyster" (formerly "oister" and in Cornwall "estren"), Germany "Auster," France "huitre," Holland "oester," Spain "ostia," Italy "ostrega" or "ostrica." F. Many postglacial deposits in Great Britain besides those mentioned in p. 39. Its variability of shape has long made the common oyster a favourite subject for species-making. Dr. Turton, in his 'British Fauna' (1807), described the "rock-oyster" from South Wales as *O. saxatilis*; and Sir Gardner Wilkinson has lately done the same in the 'Zoologist,' and called it *O. Virginica*, imagining it to be the North-American species. The following notes which I took in 1865 on examining an oyster-fishery in the river Roach, Essex, may be useful. "The fry resembles in shape the seeds of the Shepherd's purse. The front only is fringed with cilia. The body can be seen through the transparent case; part of it dark, almost black, and crossing diagonally from one side to the other—perhaps the liver. Oysters of all ages from the second year in spawn. Some of the breeding oysters more forward than others in different parts of the river—"black sick" in some places, "white sick" in others. The most forward, or "black sick," easily opened, and have evidently lost much of their muscular power; these would probably fall an easy prey to Starfishes and Annelids. The fry flit about, but not to any distance; sometimes head downwards, or whirling round as if in sport. Eyes black, one on each side of the head or front of the body. Cases filmy, and iridescent or nearly opaline. Eggs white, like miniature grains of pearl-barley." In some verses of Epicharmus (quoted by Athenæus), commemorative of Hebe's marriage, the oyster, of course, is not wanting at the nuptial feast; and it is described as difficult to open but easy to eat. Seneca appears to have been the only writer among the ancients who did not praise oysters. In his 95th Letter he asks his friend Lucilius whether this very sluggish and dirt-fattened food does not produce in the eater its own muddy dulness.

P. 45.—In 1867 the annual consumption of oysters at Paris was calculated at 288 millions. They are sold in London all the year round. Why have we not a "close time," as for Salmon, instead of allowing a million of fry to be gulped at one mouthful?

P. 47, l. 4 from top, for "Sannazarius" r. "Sannazzaro."

P. 51.—PECTEN PUSIO. N. of Hebr., 530 f. (C. & T.). F. Portrush (Portlock and A. Bell). E. Cape of Good Hope (Dunker)!

P. 53.—P. VARIUS. F. England and Ireland. E. Christiansund southwards (Sars).

P. 58.—P. ISLANDICUS. F. Gulf of Naples, in 50 f.; a single valve in a semifossil state, like those dredged in Shetland, and covered with the same arctic species of *Spirorbis*; with it was a valve of *P. opercularis*, in the same condition, and as large as northern specimens! E. Finmark to Bergen, where it becomes dwindled, in 5–50 f. (Sars).

P. 59.—P. OPERCULARIS. N. of Hebr., 530 f. (C. & T.). F. England, Ireland, Scandinavia, and Italy.

P. 62.—P. SEPTEMRADIATUS.

BODY whitish, tinged with fleshcolour, and minutely speckled with flake-white; the colour is also diversified by blotches and streaks of dark brown, orange, yellow, or greenish: *mantle* thick, folded inwards on each side; the margin is fringed with numerous cirri or tentacles, which are closely and finely ciliated; they are of different sizes, encircled by flake-white rings, and arranged in 2 or 3 rows on each side; the outermost row contains some of the largest size, which curl at their tips and are mostly of a yellow colour; under this row are placed the "eyes" or *ocelli*, about 50 on each side; these are of different sizes, not arranged symmetrically, and black, with a bright silvery pupil or nucleus in the centre.

F. Ireland and Italy. E. Loffoden I., 300 f. (Sars).

Var. *Dumasii*. BODY greyish, irregularly streaked lengthwise with dark brown and red, and closely speckled with yellowish-white: *mantle* thick and folded inwards; edges marked with a dark line, and thickly covered with pointed cirri of various lengths and sizes, which are finely ciliated; the longer ones are very extensile, and sometimes curl and unfold to a length equal to half that of the shell: *ocelli* numerous, placed more close together at the sides than in front, where they are alternately large and small; they look like globules of quicksilver, or glistening pearls, or white coral beads set in rings of dark bronze: *foot* finger-shaped, byssiferous, issuing from the notch on the posterior side below the large ears of the shell: it is of a pale orangecolour. The animal occasionally uses its foot for crawling.

This variety is connected with the type by several intermediate forms, as regards both the shell and soft parts. Dr. Hidalgo ought to compare specimens from different localities and depths.

P. 64.—P. ARATUS. N. of Hebr., 530 f. (C. & T.). It is the *P. Bruei* of Payraudeau, a Mediterranean and Adriatic species.

P. 65.—P. SULCATUS. Mr. Hanley showed me a single valve, said to have been trawled near the Runnelstone Lighthouse off the Land's End.

P. 65.—P. TIGRINUS. N. of Hebr., 170–189 f. (C. & T.). F. Norway (Sars and others); Messina (Seguenza)! E. Holland (Herklots); Brittany (Récluz and others); Arcachon (Lafont)!

P. 67.—P. TESTÆ.

BODY pale yellowish white faintly tinged with pink, mottled with dark brown, speckled with flake-white, and barred transversely with 8 or 10 irregular streaks of dark brown: *mantle* fringed with fine tentacles of different sizes, which are delicately ciliated and curl about in every direction; they are arranged in two rows, the outer tentacles being much larger than those forming the inner row; the front edges of the mantle are folded inwards, and appear to be microscopically striated in the line of the opening: *ocelli* half as many only as in *P. striatus*, and consisting of 2 rows; those in the outer row are unequal in size and irregularly distributed, one being in many cases (but not invariably) placed at the base of each pallial cirrus in that row; those in the inner row are more numerous, much smaller, and not always observable: *foot* cylindrical: *gills* in 2 pairs, fan-shaped and exquisitely pectinated, sometimes brownish or pencilled in the middle.

It flits or jerks about actively, like its congeners, and occasionally moors itself by a byssus. The colour of the soft parts is not less variable than that of the shell. When it is at rest, the mantle forms a thick semicircular cushion, striped across with yellow, brown, red, pink, and every intermediate hue. Cornwall (Hockin). F. Monte Mario (Rigacci). E. Mediterranean electric-telegraph cable, at a depth of over 1000 f. (Milne-Edwards).

P. 69.—P. STRIATUS. Plymouth (Jordan)! F. Scandinavia and Italy! E. Med. and Adr.!

P. 71.—P. SIMILIS. Shetland, 95 f. F. N.W. Germany and Italy. E. Loffoden I., 300 f. (Sars); Arcachon (Lafont)!; Jamaica (Barrett)! *P. squama*, Scacchi, and *P. pullus*, Cantraine. Not *P. Actoni*, which is the *P. concentricus* and *P. fenestratus* of Forbes, *P. Philippii* of Acton, and *P. inæquisculptus* of Tiberi.

P. 73.—Add P. VI'TREUS*, Chemnitz (*Pallium vitreum*, Chemn. Conch. Cab. vii. p. 335, t. 67. f. 637, *a*).

SHELL circular, except at the top, where the outline is square, equilateral, equivalve, rather tumid, extremely thin and fragile, scarcely glossy: *sculpture*, microscopic and very numerous hair-like striæ, which radiate from the beak to the margins, those on the larger ear being horizontal, stronger, and more remote; there are also much less numerous slight concentric lines, which are closely but irregularly studded with minute vaulted scales; these scales are not present on every part of the shell, and are sometimes almost wanting; the anterior ear of the lower valve is marked with about half a dozen horizontal and crenellated riblets, some being also observable on the anterior or byssal slope in that valve, and the upper margin of the same ear, as well as the edge of the anterior slope, are serrated or toothed: *colour* white: *beaks* minute, calyciform: *ears*, all except that on the anterior side of the lower valve broadly triangular, and not distinctly defined; the anterior ear of the lower valve is of a more irregular shape in consequence of the byssal excavation or notch at the base: *byssal notch* large: *hinge-line* straight, $\frac{3}{5}$ of the breadth of the shell: *cartilage* small: *hinge-plate* broad and smooth: *inside* nacreous, minutely striated lengthwise in the middle: *muscular scars* conspicuous. L. 0·4. B. 0·35.

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* Glassy.

Habitat: Shetland; a small valve in a mass of *Lophohelia prolifera* (Dr. Edmondston); N. of Hebr., 189 and 650 f. (C. and T.). F. Messina (Seguenza)! E. Norway and Sweden, 30–300 f. (Spengler and others); Naples and Sicily (Acton and Aradas)! *P. Gemellarii-filii*, Biondi, MS., *f.* Bernardi. Chemnitz seems to have included *P. striatus* in his description and figures *b*, *c*. *P. abyssorum*, Lovén, MS., is a smooth variety.

P. 73.—P. maximus. F. Sweden and Italy. E. Spain, from 4 f. downwards (Hidalgo).

P. 78.—Lima Sarsii. W. coast of Shetland, a single valve; N. of Hebr., 170 and 189 f. (C. and T.). F. Sicily and Rhodes! E. Loffoden I., 300 f. (Sars). Probably *L.* (*Limatula*) *crassa* of Forbes, from the Ægean, 105–230 f.; but his description is too short, and he does not notice the transverse or concentric striæ.

P. 81.—L. elliptica.

Body whitish, with a faint tinge of orange: *mantle* fringed with several tentacles of different lengths; these are cylindrical when fully extended, but conical and thick when contracted, and are closely ringed; in the young they are white, and in the adult tipped with lemoncolour or pale yellowish-brown: the tentacles are arranged in three rows, of which those on the outside are the smallest and shortest, the innermost being the longest: *foot* dibble-shaped and pointed, the inner portion or core being pale orange and enclosed in a clear gelatinous case: it is folded inwards, so as to make a groove; the heel or byssiferous part of this organ is rather prominent: *gills* horn-colour, in 2 nearly equal-sized pairs.

One of my largest specimens moored itself to the side of a glass vessel in which it was kept, by two threads as fine as any that spiders spin; and it was thus held suspended in the water. It afterwards warped itself up by applying the point of its foot to the glass, and step by step repeating the process. N. of Hebr., 170 and 189 f. (C. and T.). F. Coralline Crag, Antwerp, Norway, Italy, and Rhodes! E. Loffoden I., 300 f. (Sars); Med., Adr., and Æg.! The young may be *L.* (*Limatula*) *cuneata* of Forbes.

P. 82.—L. subauriculata.

Body pale lemoncolour: *tentacles* about 40, thick, of different lengths and sizes, exquisitely ringed; they form a sort of chevaux de frise: *foot* finger-shaped, extensile, with a brownish nucleus: *liver* scarlet-red.

F. Norway, Vienna basin, Italy, and Rhodes! E. Atlantic coasts of France, and both sides of N. America. Arctic specimens are more than twice the size of ours. *L. nivea* (if Renier's species) has no furrow; it occurs with *L. subauriculata* in the Coralline Crag at Sutton (as *L. ovata*, S. Wood), the Vienna basin, and at Monte Mario and Ancona! Renier (not Renieri, as erroneously spelt by some writers) did not describe his *Ostrea nivea*; he merely added to the name the following note:—"Prossima all' *Ostrea inflata* di Gmelin e all' *Ostrea bullata* di Born." It appears to be the *O. nivea* of Brocchi, judging from his description and figure; although he perhaps united *L. subauriculata* with it, and referred to *L. elliptica* as a living species and half an inch long.

P. 85.—L. LOSCOMBII. F. Norway, Italy, and Rhodes!

P. 87.—L. HIANS. F. Glacial bed, Errol (Crosskey)!; Monte Mario and Messina!

P. 89, l. 4 and 5 from bottom. The filaments or tentacles are not prehensile; and the *Limæ* feed on animalcula. Prof. Lacaze-Duthiers described the "nest" or "gîte" in the 'Annales des Sciences Naturelles' for December 1865; he evidently was not aware that this had been previously done.

P. 96.—AVICULA HIRUNDO. Falmouth (Hockin). F. Italy. E. Atlantic coasts of France and Spain. The fry, scarcely half a line in length, is even more inequivalve than the adult; the wing-like process at the broader end is not developed in the earlier stages of growth, and the beak or umbo is very prominent.

P. 99.—PINNA RUDIS. The animal is marvellously small in bulk or weight in proportion to the shell, and when dead does not occupy the twentieth part of it. The anterior or front muscle forms a huge bundle, of the thickness of a man's thumb, and holds the valves in position. It is by this muscle that the long-line fisherman hooks the *Pinna*, and detaching it from the byssus drags it up from its bed. Poli, Costa, and many other authorities regarded our species as the *rudis* of Linné, who gave the Mediterranean as well as the Indian Ocean as a habitat. It certainly is not his *pectinata.*

> . . . . "Confusion's cure lives not
> In these confusions."

P. 104.—MYTILUS EDULIS. Sea of Okhotsk (Middendorff); N. Japan (Schrenck). Dr. Edmondston informs me that in the north of Shetland large quantities of the stunted form are scraped off the rocks and "sown" in the voes to produce a crop of mussels of the usual size for fish-bait.

P. 111.—M. MODIOLUS. F. Monte Mario (Rigacci)!; Reggio in Sicily (Acton)! E. N. Japan (Schrenck and Lischke)!; Greenland and Spitzbergen (Baer and Middendorff); Brittany (Cailliaud and Taslé)!; W. coast of N. America (P. Carpenter). Schrenck has identified this species with *Modiola Philippinarum* of Hanley, and with *Modiola australis* of Gray from New Holland.

P. 116.—M. BARBATUS. The species so named in the 'Fauna Suecica' is most probably *M. modiolus.*

P. 116.—M. ADRIATICUS. F. Monte Mario (Rigacci)! E. Adriatic, 10–30 f.! *M. Cavolini,* Scacchi. Var. *ovalis.* Brittany (Cailliaud and Taslé)!

P. 118.—M. PHASEOLINUS. F. Norway and Italy! E. Atlantic coasts of France, Med., and Adr.!

P. 122.—MODIOLARIA MARMORATA. Of a smaller size, in *Diazona Hebridica* and other compound Tunicata. F. Monte Mario (Rigacci)! E. Vancouver's I. and W. coast of N. America (P. Carpenter).

P. 125.—M. COSTULATA. F. Italy. Mr. A. Bell has lately found in the Red Crag a perfect specimen of *M. Petagnæ,* Scacchi; it inhabits the Bay of Biscay and the Mediterranean.

P. 126.—M. DISCORS. N. of Hebr., 530 f. (C. and T.). F. Scandinavia and Canada. E. Wellington Channel (Belcher)!; Canada (Bell). Mr. Barlee's collection contains a specimen $\frac{3}{4}$ inch in breadth.

P. 128.—M. NIGRA.

BODY whitish, with a tinge of yellowish-brown: *mantle* widely open on the anterior side and in front, thickened at the edges, which are plain: *tubes* almost sessile, obliquely truncated towards the front of the shell; upper one much the smaller; lower one not well defined, and scarcely separated from the folds of the mantle on the postico-ventral side; orifices thickly studded with flake-white tubercles or papillæ: *foot* vermicular, and pointed at the end: *gills* consisting of 2 pairs, the outer of which is much larger than the other and enwraps it.

F. Errol (Crosskey)!; Labrador, Canada, and Maine. E. Holland (Herklots); Sea of Okhotsk, Wellington Channel, and Labrador. *M. striatula*, Beck.

P. 131.—CRENELLA RHOMBEA. Cornwall (Hockin); Bundoran (Waller)! F. Antwerp Crag (Nyst)! E. Naples (Stefanis)!

P. 133.—C. DECUSSATA. Ligament wholly internal, elongated, and covering a great part of the hinge-plate. N. of Hebr., 189 and 530 f. (C. and T.). F. Norway. E. Lofoden I., 300 f. (Sars); Gaspé Bay, Gulf of St. Lawrence (Whiteaves)!

P. 135.—*Modiola cuprea* is the fry of *C. faba*.

P. 141.—NUCULA SULCATA. F. Caithness (Peach)!; N.W. Germany, and Italy. E. Atlantic coasts of France!

P. 143.—N. NUCLEUS. N. of Hebr., 530 f. (C. and T.). F. Scandinavia, Belgium, and N.W. Germany.

P. 149.—N. NITIDA.

BODY whitish: *mantle* slightly extending beyond the valves; margin closely fringed with short cilia: *tubes* inconspicuous: *foot* tongue-shaped; when protruded, it unfolds like the leaf of a fan-palm, and displays a beautiful comb-like fringe at its edges; the sole then assumes an oval shape, and the pectinations diminish in size towards its point or extremity, and are larger at its sides.

E. Atlantic coasts of France, and throughout the Mediterranean!

P. 151.—N. TENUIS. N. of Hebr., 189–650 f. (C. and T.). F. Scandinavia, S. Italy, and Canada. E. Brittany (Cailliaud and Taslé); Algeria (coll. M'Andrew)!; Corsica and Naples (Tiberi and others)!; Ægean (Forbes); N. Asia and W. coast of N. America (P. Carpenter). *N. ægeensis*, Forbes, and *N. Macandræi*, Hanley, from the types.

P. 154.—LEDA PYGMÆA. F. Scandinavia and Maine. E. Loffoden I., 300 f. (Sars); Gulf of Gascony, 40–80 f. (Marquis de Folin, *f.* Fischer, as *L. tenuis*)!; Gulf of Naples and Sicily, 50–60 f. (Acton and Stefanis)! The recent discovery of this and other species hitherto considered northern in the Bay of Biscay, as well as in the Mediterranean, confirms the suggestion which I threw out in my last Report to the British Association on Shetland dredgings, that at some former period there existed a communication between the North Atlantic and the Mediterranean, by which the submarine fauna became diffused. The only objection to the hypothesis seemed to be the want of proof that these species had been found in any intermediate locality. I have given the size as too great; it should be 1 line in length by 1½ in breadth.

P. 155.—L. LU'CIDA*, Lovén (*Yoldia lucida*, Lov. Ind. Moll. Scand. p. 34).

SHELL more than twice the size of *L. pygmæa*, thinner, rather depressed instead of tumid or gibbous, and less equilateral; the dorsal margin on the anterior side slopes very gradually (and not abruptly as in that species); and the corresponding margin on the posterior side is more inclined to be straight, and in some specimens is a little raised and pinched in near the beak; the posterior side is depressed, broad, angular, and obliquely truncated. L. 0·15. B. 0·2.

HABITAT: N. of Hebr., 189–650 f. (C. and T.). Some of these localities may be considered British, being much nearer to Scotland than to the Faroe Isles. F. Clyde Beds (Crosskey and Robertson)!; Norway (Sars); Calabria (Philippi, as *Nucula pellucida*). E. Boh.—Finm. (Lovén)!; Upper Norway, 10–160 f. (M'Andrew and Barrett)! It may be the *Nucula navicularis* of Couthouy, from the Massachusetts coast. *Yoldia nana* of Sars, from 300 f. in the Loffoden Isles, appears to be a small variety.

P. 155.—L. MINUTA. F. Scandinavia, Labrador, and Canada; not our Crag. E. W. coast of N. America (P. Carpenter).

P. 158.—L. PERNULA. Loch Duich in Rosshire, and St.

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* Shining.

Magnus Bay on the west coast of Shetland; not living, and mostly single valves. F. Scotch and Irish glacial beds, Scandinavia, and Canada. E. Spitzbergen—Bohuslän, 20–150 f.

P. 158.—l. 16 from top, for "Lamarck" r. "Philippi."

P. 159, l. 4 from top, for "Sassi" r. "Sasso." I am indebted to the Marquis James Doria for a copy of the Journal which contains Sasso's paper.

P. 161.—LIMOPSIS AURITA. N. of Hebr., 189 f. (C. and T.). F. N.W. Germany (Philippi). E. Wellington Channel; single valves of a large size, with a more oblique outline (Belcher)! One of my Shetland specimens is half an inch long.

P. 164.—L. BOREA'LIS *, Woodward, MS.

SHELL trapezoidal, with the broader end more or less obliquely extended, depressed, rather thin, opaque, and lustreless: *sculpture* as in *L. aurita,* but without the beaded or granulated character; the surface is slightly cancellated by longitudinal and concentric striæ, which are comparatively fewer and therefore more distant than in that species: *colour* whitish: *epidermis* light yellowish-brown, forming a series of ciliated or fringed rows on the longitudinal striæ: the outermost fringe projects considerably beyond the edge of the shell: *margins* rounded in front and at the narrower end, and sloping with a gentle curve from the beak to the broader end: *beaks* small, blunt, scarcely prominent, incurved: *hinge-area* long, reddish-brown, striated transversely: *cartilage* and *hinge-line* as in *L. aurita*: *hinge-plate* rather narrow, occupying about $\frac{1}{5}$ of the circumference of the shell: *teeth* small, 5 or 6 curved ones on the narrower side, and 4 oblique ones on the other side: *inside* of a dull and chalky appearance, indistinctly striated lengthwise, with a row of numerous and small tubercles a little within the edge, which is plain and sharp; these tubercles encircle the inner rim, and are the terminations of the longitudinal striæ: *pallial and muscular scars* distinct. L. 0·325. B. 0·325.

HABITAT: A small single valve, with *L. aurita,* in 189 f. about 50 miles north of the Hebrides (C. and T.). E. Nordland, 70–100 f. (M'Andrew and Barrett)!; Upper Norway, at depths reaching to 450 f. (Sars)! This species was referred by M'Andrew and Barrett to *Pectunculus pygmæus* of Philippi, and by Sars to his *P. minutus*. But the last named species (of which *L. pygmæa* is probably the younger state or a variety) is very much smaller than *L. borealis*, although stronger and more solid; it has a less oblique outline, more numerous striæ (which present the same beaded or granulated appearance as in *L. aurita*), and fewer teeth; and the inside edge is closely crenellated, instead of having a row of tubercles placed within the edge, which is plain and sharp. *L. abyssicola* of A. Adams, from 136 f. off the Cape of Good Hope, is allied to the present species, but is more closely cancellated, and the marginal notches are finer and more numerous. I have a small living specimen of *L. pygmæa* from Corsica.

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* Northern.

P. 165, l. 4 from top, "beaks" should be in italics.

P. 166.—PECTUNCULUS GLYCYMERIS. N. of Hebr., 189 f. (C. and T.).

Var. *globosa*. SHELL smaller, and more tumid; colour of a deeper brown and nearly uniform; cardinal area or space below the beak in each valve denticulated. Guernsey. E. Algeria (Weinkauff)!

P. 169.—*Arca pilosa* of Linné is not our species, but a much larger and heavier shell.

P. 171.—A. PECTUNCULOÏDES.

Mantle plain-edged: *tubes* pale yellowish-brown, irregularly speckled at the extremities with flake-white: *foot* white: *liver* bright orange.

Orkneys (Thomas)!; N. of Hebr., 170–650 f. (C. and T.). F. Postglacial deposits in Norway. Nyst's specimens, from the "sable noir," have a notched margin, and probably belong to a different species. E. Loffoden I., 300 f. (Sars); Gulf of Naples, 60 f. (Acton and Stefanis)!

P. 173, l. 10 from top, for "*Pomatoceros arietinus*" r. "*Ditrypa arietina*".

P. 175.—A. OBLIQUA. N. of Hebr., 189 f.; a single valve (C. and T.). F. Sicily (Seguenza)! E. Corsica (Susini)!; Naples (Stefanis)!

P. 177.—A. LACTEA. F. Macclesfield, 500–600 ft. (Darbishire)!; Belfast, 106 ft. (Bryce and Hyndman). E. Atlantic coasts of France and Spain.

P. 180.—A. NODULOSA. Orkneys; a single valve (Thomas)!; N. of Hebr., 170–530 f. (C. and T.). F. Norway and Calabria! E. Loffoden I., 300 f. (Sars); Med. and Adr.! *A. scabra*, Poli, and *A. aspersa*, Philippi.

P. 180.—A. TETRAGONA. F. Portrush (A. Bell)!; Italy (Scacchi and others). E. Madeira (Watson)!

P. 183.—A. BARBATA. E. Atlantic coasts of France, from Quimper to Rochelle.

P. 188.—GALEOMMA TURTONI.

It has no pallial tube. The mantle is folded on both sides in front, so as to form a rather wide incurrent opening, through which food and aërated water are introduced. Innutritious matter and perhaps the exhausted water are occasionally ejected through this opening by a kind of spasmodic jerk. At the opposite or posterior end there is a round hole in the mantle, which has an excretal function; its margin is minutely scalloped. This latter orifice is sometimes closed. Above each of these orifices is a remarkable short club-shaped process, like a small tentacle; these processes are not protruded, but are capable of a slight degree of extension. They may serve as feelers or tentacles to warn the mollusk of any enemy approaching it from behind. The posterior process has the end thicker than the anterior one; otherwise they appear to be equal in size. The mantle is spread outside over the shell, so as to make the latter internal, as is partially the case in *Cypræa*. Its surface is covered with tubercles of different sizes; and around the edges of the valves on each side is a row of 4 tubercles of a larger size than the rest, and resembling eye-specks. I could not detect any "cord" or mark to separate the outer and inner layers of the mantle; the edges of the valves showed the only line of division. The foot is tongue-shaped, and extremely flexible. It is thrust out in front to a considerable distance when the animal is on the march. The valves then lie open with the beaks upwards. When the *Galeomma* is at rest, it adheres by the inner and expanded flaps of the mantle. The fæcal pellets are oval and light yellowish-brown. Clark has well described the byssus. The substance of the body is gelatinous and almost transparent. The gills and palps (2 pairs of each) are distinct; the latter are pale brown.

West of Ireland (Battersby); southern entrance of St. George's Channel (M'Andrew)! This pretty creature evidently loves the cool shade. Specimens which I put on a bunch of *Chondrus crispus* soon crept away and got on the underside. M. Mittré's notion that it lives on seaweeds must be erroneous. It has no oral apparatus for taking such food. The indraught through the open fold of the mantle is precisely similar to what I have also observed in other bivalves which subsist by absorbing minute organisms into the stomach. The reproduction and embryogeny of *Galeomma* are unknown.

P. 194.—LEPTON SQUAMOSUM. F. *L. nitidum* of S. Wood appears to be the young of the present species; Monte Mario (Conti)! E. Cherbourg (Récluz, MS.).

P. 198.—L. NITIDUM. F. Clyde Beds! E. G. Gascony, 40–80 f. (de Folin); Naples, 60 f. (Acton)!

P. 201.—L. SULCATULUM. E. Sicily (Stefanis)!

P. 202.—L. CLARKIÆ. Falmouth (Hockin)!; Jersey (Dodd)! F. Coralline Crag, Sutton (coll. Wood)!

P. 205.—MONTACUTA SUBSTRIATA. Shetland, 170 f., on *Spatangus meridionalis*. F. Norway (Sars); Monte Mario (Rigacci, as *Elizia orbiculata* of Conti)! E. Norway, 10–250 f. (Sars); Arcachon (Lafont)!; Dalmatia (Brusina, as *Kellia spantangi*)! The fry are nearly globular, like *Kellia suborbicularis*, with the beak in the middle of the dorsal area. *Sphenia costulata*, Macgillivray.

P. 208.—M. BIDENTATA. F. Fairlie, near Glasgow (A. Bell)!; Bohuslän (Thudén); Monte Mario (Conti and Rigacci)! E. As far north as Öxfjord in Finmark, shore to 50 f. (Sars); Adriatic (Brusina)!; Madeira (Johnson)!

P. 210.—Add M. TUMI'DULA*, Jeffreys.

SHELL rhombic-oval, resembling in shape a young *Tapes virgineus*, rather gibbous, thin, semitransparent, glossy, and prismatic: *sculpture*, numerous and close-set delicate, microscopic concentric striæ: *colour* pale yellowish-brown: *epidermis* fine and silky: *margins*, on the posterior side extremely short and abruptly sloping downwards, without any of the angularity which characterizes *M. bidentata*; in front gently curved; on the anterior side considerably expanding and rounded; on the back rising towards the anterior end: *beaks* small, calyciform, blunt, prominent, incurved, but not having any indentation below them; they are placed close to the posterior side, which is shorter than the other side, and not $\frac{1}{6}$ of its size: *hinge-line* rectangular, occupying about $\frac{1}{3}$ of the circumference: *cartilage* as in *M. bidentata*: *hinge-plate* narrow and strong, thicker in the middle, not excavated so deeply as in the last-named species, and scarcely at all in the right valve: *teeth*, in the right valve short, triangular, slightly inclining inwards, not widely separated; in the left valve long, erect, laminar, and parallel with the hinge-line; the anterior teeth are the largest in both valves: *inside* iridescent and polished, very finely marked (more distinctly on the anterior side) with slight lines which radiate from the beaks: *scars* irregularly oblong, and conspicuous. L. 0·075. B. 0·1.

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* Somewhat swollen.

Habitat: Hebrides and Shetland, 40–80 f., in muddy ground; rare. E. Bohuslän (Lilljeborg)! Smaller than *M. bidentata*, and distinguishable by being narrower, not depressed, but convex, having a glossy surface, and by the posterior side being disproportionately small and abruptly truncated; that side in *M. bidentata* is invariably squarish, and more or less angulated. The teeth in the right valve of *M. tumidula* are much smaller than in the same valve of *M. bidentata*, and are not so widely separated by the cartilage-pit; they are triangular and not leaf-like, and slightly incline inwards instead of being erect.

P. 210.—M. ferruginosa. F. Portrush (Portlock); Norway and Monte Mario! E. Norway, 5–50 f., and Greenland (Sars); Arcachon (Lafont)!; Mediterranean (M'Andrew and others)!; Adriatic (Brusina)!; Maderia (Watson)!

P. 216.—M. Dawsoni. Mr. Dawson has since dredged off Cruden in the Moray Firth two or three perfect specimens and many single valves of this curious little shell. When quite fresh they have a light yellowish green epidermis. In shape and size this species resembles *Kellia pumila* of S. Wood from the Coralline Crag; but the hinge is essentially different.

P. 216.—M. donacina. I last year dredged another valve (the left) in St. Magnus Bay, Shetland. Both valves figured.

P. 217.—LASÆA. Lasæa, a Town in Crete, mentioned in the Acts of the Apostles. This generic name was republished by Brown in 1844.

P. 219.—L. RUBRA. F. Portrush (A. Bell)!; S. Italy (Calcara and Conti). E. Japan (P. Carpenter); Straits of Magellan (Philippi, *f.* Dunker).

P. 225.—KELLIA SUBORBICULARIS. F. Portrush (Portlock); Monte Mario (Conti)! E. Mazatlan, and Aracan in the Indian Ocean (Hanley)! *Cyclas pustula* and *Cycladina clandestina*, Costa.

P. 228.—K. CYCLADIA. A few living specimens and single valves have been lately dredged off Shetland, in 60–90 f. E. Gulf of Naples, 60 f. (Acton)! *K. orbicularis* of S. Wood is the same species.

P. 233.—LORIPES LACTEUS. F. South-European tertiaries. Most savoury for making sauces (Poli); I have eaten it plain-boiled, and found it delicious.

P. 235.—L. DIVARICATUS. Hayle sands; single valves (Miss Hockin)! F. Killiney, near Dublin (Walpole)!; Italy (Scacchi and others). E. Atlantic coasts of France and Spain.

P. 238.—WOODIA DIGITARIA. F. Killiney (Walpole)! E. Atlantic coasts of Spain (M'Andrew and Fischer)!

P. 240.—LUCINA SPINIFERA.

BODY whitish: *mantle* thick, protruding occasionally beyond the valves; edges plain: *tubes* sessile, and not visible outside: *foot* vermicular, flexible, and pointed.

F. Italy (Scacchi and others).

P. 242.—L. BOREALIS. N. of Hebr., 530 f. (C. and T.). E. W. coast of N. America; recent and fossil (P. Carpenter and Cooper); Philippines (Cuming, *fide* P. Carpenter).

P. 247.—AXINUS FLEXUOSUS.

BODY clear white: *mantle* slightly protruding beyond the valves; edges plain: *tubes* inconspicuous: *foot* issuing from a slit in the mantle, vermicular, very long (capable of being extended nearly three times the length of the shell) and slender, with a point shaped like a spear-head, which is wider than the rest of the foot; this process is not unlike the creeping-disk of *Crenella*, except that the latter is oval.

F. Monte Mario (Conti)!; Canada (Bell); miocene [?] formation in Belgium, Germany, France, and Italy (Bronn). E. Loffoden I., 450 f. (Sars); W. coast of N. America (P. Carpenter and Cooper). Var. *polygona.* Off Unst, 95 f. Var. *Gouldii.* N. of Hebr., 550 f.; "cold area," temperature of bottom 32°·5 (C. and T.). F. Helensburgh, N. B. (Robertson)!; Maine (Packard). E. Labrador, 15–50 f. (Packard); Maine (Mighels).

P. 250.—A. CROULINENSIS.

BODY clear white: *mantle* having its edges puckered: *incurrent tube* forming a wide slit, which scarcely protrudes beyond the valves: *foot* placed as in *A. flexuosus,* assuming various shapes, and often bulbous at the point.

Off Unst, 90–140 f. (J. G. J.); N. of Hebr., 189 and 650 f. (C. and T.). E. Loffoden I., 450 f. (Sars, as *A. pusillus*)!; Naples (Acton and Stefanis)!; Madeira (coll. M'Andrew)! It crawls, like *Crenella decussata,* by extending its foot and attaching itself by the point.

P. 251.—A. FERRUGINOSUS.

BODY pale greyish-white: *mantle* having thick and expansile edges, which protrude when the animal is feeding; it forms a long and narrow (but not tubular) slit or fold on the ventral side: *foot* cylindrical, very extensile.

Hebrides in soft and tenacious mud, 133 f. (J. G. J.). F. Christiania (Crosskey and Robertson)! E. Loffoden I., 250 f. (Sars): Naples (Tiberi and Acton)!

P. 254.—DIPLODONTA ROTUNDATA. Belgrave Bay, Guernsey, living in sand at low water of spring tides (Gallienne). F. Antwerp Crag (Nyst); Italy (Brocchi and others); Rhodes (Mus. J. d. Pl.)! E. Atlantic coasts of France, Mediterranean, and Adriatic. *Venus lupinus,* Brocchi.

P. 260.—CYAMIUM MINUTUM. F. Norway (Sars). E. Brittany (Cailliaud); G. Gascony (Fischer); Behring's Straits, 20–40 f. (Gould). Römer placed this species in the genus *Venus*!

P. 263. CYPRICARDIA LITHOPHAGELLA. Mr. Waller has also found a small single valve in dredged sand from Guernsey. E. Loire-Inférieure (Cailliaud)! *C. Renieri,* Nardo, and *Byssomia fragilis,* Costa.

P. 268.—CARDIUM ACULEATUM. F. Italy. E. Holland

(Herklots); Atlantic coasts of France and Spain (Taslé, Fischer, and M'Andrew).

P. 270.—C. ECHINATUM. F. Scandinavia and Italy. *C. mucronatum*, Poli.

P. 273.—C. TUBERCULATUM. F. Macclesfield, 500–1200 ft. (Darbishire)!; Hope's Nose, Torquay (Godwin-Austen); Killiney (Walpole)!; Italy (Sasso and others).

P. 275, l. 17 from bottom, for "ii." r. "i."

P. 275.—C. PAPILLOSUM.

BODY lemoncolour: *mantle* thick, with open or pouting lips; it is irregularly fringed with cirri or tentacles, which on the anterior side are short, few, and bush-like, but on the posterior side are longer, more numerous, and filiform, or sometimes curled; these cirri are microscopically pustulated, and evidently very sensitive: *incurrent tube* transversely oval, set round with spike-shaped cirri which encircle it like chevaux de frise; it is mottled with reddish-brown: *excurrent tube* smaller and plain, with reflexed edges; anal valve bell-shaped and hyaline: *foot* pale orange, of a lighter colour towards the point.

Dredged off St. Martin's Point on the south coast of Guernsey. F. N.W. Germany (Philippi); Italy (Fonsega and others). E. Brittany (Cailliaud and Taslé)!; Arcachon (Lafont)!; Corunna (M'Andrew and H. Woodward)!

P. 278.—C. EXIGUUM. N. of Hebr., 530 f. (C. and T.). F. Killiney (Walpole)!; Caithness (Peach)!; Norway and Italy. Var. *subquadrata*. Guernsey and Jersey (Jordan)! In Balta Sound this species lives attached by the byssus to *Laminariæ*; Mamo says that Maltese specimens also are byssiferous.

P. 281.—C. FASCIATUM. F. Red Crag at Toft Monks, Norfolk (Rose)!; Portrush (A. Bell)!; Norway and Italy! E. Brittany (Cailliaud and Taslé)!; Dalmatia (Brusina)! Hællebæk is the name of a place in Zealand, and not of a person. *C. ambiguum*, Costa, and *C. Helleri*, Brusina.

P. 283.—C. NODOSUM. F. Norway (Sars and others). S. Wood's species of this name appears to be *C. fasciatum*. E. Brittany (Cailliaud and Taslé)!; G. Gascony (De Folin)!; Naples (Acton)!; Algiers (Weinkauff)!

P. 286. C. EDULE. F. Scandinavia, N.W. Germany, and Italy. E. Caspian (Dunker)!

P. 292.—C. MINIMUM.

BODY whitish, and of a gelatinous consistence: *mantle* protruding considerably beyond the valves; edges minutely serrated or fringed with fine thorn-like points: *tubes* very short, clothed with slender and pointed cirri of various sizes and lengths, which are irregularly disposed outside; some of these cirri are tinged with orange at their tips: *foot* proportionally large, tongue-shaped, rather narrow, flexible, sometimes extended to a great length, and vermicular.

N. of Hebr., 170 and 189 f. (C. and T.). F. Norway and Italy! E. Loffoden I., 300 f. (Sars); Brittany (Cailliaud and Taslé); Naples (Acton and Stefanis)!; Adriatic (Brusina)! I have examined Philippi's type in the Berlin Museum.

P. 294.—C. NORVEGICUM. F. Scandinavia and Italy. The foot is endued with great strength and activity. It was suddenly thrust out of a fine specimen which I held in my hand to examine, and by dint of successive vigorous jerks the animal succeeded in getting back to the basin of water from which I had removed it. Var. *rotunda*. Shetland; rare. This species is *C. lævigatum*, Poli.

P. 298.—ISOCARDIA COR.

BODY brownish-yellow: *mantle* closed in front, with broad and plain edges: *tubes*, the larger or incurrent one forming an oblong slit, and fringed with numerous short cirri or tentacles.

Shetland, 40–80 f. (J. G. J.); Iona (Duke of Argyle); St. Andrews (M'Intosh). F. Antwerp Crag, Scandinavia, N.W. Germany, and Italy. E. Atlantic coasts of France and Spain, and the Adriatic. The fry is not unlike a very young *Venus lincta* in shape; it is the *Kelliella abyssicola* of Sars, from 450 f. in the Loffoden Isles.

P. 304.—CYPRINA ISLANDICA. F. Baring I., N. America (M'Clure); Scandinavia, Belgium, Germany, and Italy. E. Holland (Herklots); Brittany, dredged alive (Taslé); Arcachon, several valves (Lafont)! A specimen found by Mr. Walpole on the Wexford coast measures 5¼ inches in length and breadth.

P. 311, l. 3 from top, for "*costatus*" r. "*sulcatus*."

P. 311.—ASTARTE SULCATA.

BODY yellowish or pale orange, with a tinge of fleshcolour: *mantle* slightly grooved lengthwise at the edges, which are thickened and plain; there are a few small white tubercles at the posterior side: *foot* tongue-shaped, pale yellow: *gills* delicately pectinated.

Typical. N. of Hebr., 170–550 f. (C. and T.). F. Norway (Sars and others); Antwerp Crag (Nyst); Messina (Seguenza)! E. Loffoden I., 300 f. (Sars); Hveen, Denmark (Œrsted); Cherbourg (Récluz). Var. *Scotica*. F. Norway (Sars). E. Loffoden I., 250 f. (Sars); Brittany (Récluz); Toulon (Souleyet). Var. *elliptica*. F. Scandinavia, Canada, and U. S. E. Labrador (Packard). A form intermediate between this variety and the type has been found in a fossil state at Belfast by Mr. A. Bell, and living in the Faroe Isles by Sysselman Müller. Var. *incrassata*. F. N.W. Germany (Philippi); Italy (Brocchi and others).

P. 315.—A. COMPRESSA.

BODY yellowish or pale orange: *mantle* slightly lineated towards the edges, which are thickened, of a darker hue, and minutely tuberculated on the posterior side: *foot* tongue-shaped, yellowish-brown.

E. Vancouver's I. (P. Carpenter, as *A. compacta*). Var. *globosa*. N. of Hebr., 530 f. (C. and T.). F., with var. *striata*, Siberia, Labrador, Canada, and U. S. This species is *Venus Montagui*, Dillwyn.

P. 318.—A. TRIANGULARIS. F. Antwerp Crag (Nyst, as *A. minuta*); N.W. Germany (Philippi, as *A. lævigata*); Monte Mario (Conti, as *Cyclina undata*)! E. Brittany (Récluz); Loire-Inférieure (Cailliaud)!

P. 319.—*A. crebricostata*. N. of Hebr., 550 f., in "cold area" (C. and T.). F. Gardiner, Maine co. (Lyell). *A. Warhami*, Hancock.

P. 320.—*A. borealis*. F. Greenland, Scandinavia, and N.E. America.

P. 322.—CIRCE MINIMA. F. Antwerp Crag (Nyst, as *Cytherea trigona*); Italy (Calcara and others). E. Bergen (Sars);

Corunna (M'Andrew and H. Woodward)! Unquestionably *Venus* [illegible] of Scacchi, from comparison with the types.

P. 3[illegible].—Venus exoleta. F. Antwerp Crag (Nyst); Norway (Sars); Pisa (Manzoni).

P. 330.—V. lincta. F. Norway (Sars and others); Pisa (Manzoni).

P. 332.—V. Chione. F. Macclesfield, 500–1200 ft. (Darbishire)!; Selsea (A. Bell)!; Antwerp Crag (Nyst).

P. 334.—V. fasciata. N. of Hebr., 189 f. (C. and T.). F. Norway (Sars). E. Jokohama, Japan (Allcock)!

P. 337.—V. Casina.

Body fleshy, pale lemoncolour, mottled with pink and closely speckled with white: *mantle* protruding beyond the shell; edges beautifully fringed with short cirri: *tubes* conical, extended sometimes to a length equal to $\frac{1}{3}$ the breadth of the shell; they are united, except at their orifices, which are sometimes brown, and each is encircled with about 20 cirri: *foot* large, thick, and tongue-shaped or securiform. The animal moves from place to place by attaching the point of its foot, and, after expanding and extending it, withdrawing its hold and expelling forcibly the water it had taken in; by repeating this operation it soon traverses a considerable distance.

N. of Hebr., 530 f. (C. and T.). F. Moel Tryfaen (Drury Lowe)!; Pisa (Manzoni).

P. 339.—V. verrucosa. F. Strethill, Salop (Maw)!; Portrush (Portlock); Killiney (Walpole)!; not Coralline Crag; Italy (Scacchi and others). E. Africa, America, and Indian Ocean (Römer). Cultivated in the west of France and at Monaco as an article of food. M. Lallemant believes that it arrives at maturity in eight months.

P. 342.—V. ovata. N. of Hebr., 189–550 f.; brightly and deeply coloured specimens (C. and T.). F. Scandinavia and Italy. E. Attached to Mediterranean telegraph-cable between Cagliari and Bona, at a depth of 2000 mètres (Milne-Edwards, *fide* Weinkauff).

P. 344.—V. gallina. F. Portrush (Portlock); Killiney (Walpole)!; Scandinavia (Sars and others); Pisa (Manzoni). Var. *laminosa*. E. Japan (Allcock)! Mr. M'Andrew, in his

"Report on South European Marine Invertebrata [illegible] ved that at Algiers the typical form inhabits the littoral [illegible] while the form called *striatula* occurs only at a depth of [illegible] and in a communication from him to Prof. E. Forbes (An[illegible] H. [illegible] d ser. iii. p. 509) he says, with reference to his dredgings off Cape St. Mary's in 15–30 f., "The *Venus* from that locality appears to be intermediate between the *gallina* of the Mediterranean and *striata* [*striatula*] of our seas, so that they may at last prove to be only varieties of the same species." Prof. Römer has lately restored *V. pallida* of Turton as a species!

P. 349.—Tapes aureus.

Body pale yellowish-white, with reddish-brown spots or blotches round the orifices of the tubes: *mantle* thick and fleshy, more or less open in front, so as to form a slit; edges irregularly scalloped: *tubes* cylindrical, short, united nearly to their orifices; the incurrent tube is the longer of the two, and streaked inside lengthwise with yellow or flake-white lines; its orifice is fringed with 6 short cirri or tentacles and the same number of intermediate tubercles; the excurrent tube has also its orifice fringed, but less thickly, and the cirri are equal in size: *foot* large, laterally compressed, and wedge-shaped at the point.

Roach river or estuary, Essex. F. Scandinavia (Sars and others); Antwerp Crag (Nyst); Pisa (Manzoni); Monte Mario (Rigacci)! Exceedingly prolific, Poli. According to E. v. Martens this is the *Venus edulis* of Chemnitz and *V. lutescens* of Gmelin. Var. *ovata*. Herm (Marshall)!; Lake Fusaro, near Naples (J. G. J.).

P. 352.—T. virgineus. F. Norway (Sars); Prussia (Berendt); Italy (Scacchi and others); Rhodes (Mus. J. d. Pl.)! E. Finmark, 5–40 f. (Sars); Holland (Herklots); N.W. France (Guestier, *f.* Fischer).

P. 355.—T. pullastra. F. All our posttertiary deposits, as well as those from Norway to Sicily. E. Holland (Herklots), and throughout the European seas; Japan (Allcock)! *T. geographicus* is undoubtedly the same species. *Venus Tenorii*, Costa, and *T. Senegalensis*, Römer.

P. 357, l. 13 from bottom, for "*arctica*" r. "*rugosa*."

P. 359.—T. decussatus. F. Torquay (Godwin-Austen);

Killiney (Walpole)!; Pisa (Manzoni). E. N. Japan, Indian and Pacific Oceans (Schrenck).

P. 361, l. 7 from bottom, for "*P*" r. "*T.*"

P. 363.—LUCINOPSIS UNDATA. F. Norway (Sars); Gardiner, Maine (Lyell)!

P. 367.—GASTRANA. *Fragilia*, Desh. (1848).

P. 367.—G. FRAGILIS. Not *Venus fragilis*, Fabricius, nor *Tellina fragilis*, Möller.

P. 371.—TELLINA BALAUSTINA.

Mantle more protruded at the posterior side; edges minutely ciliated: *tubes* cylindrical, separate, very finely and closely lineated lengthwise; orifices plain; upper or excretal tube much longer than the other, occasionally extended nearly twice the length of the shell in the same direction; it is fringed at the sides with short close-set microscopic cilia, and contracted at the opening; sometimes the lower or alimentary tube is the only one protruded: *foot* tongue-shaped, broad. Leaps or jerks along with considerable rapidity, by folding and flapping its foot. A kind of spring is thus produced, and the course taken is usually straight.

Guernsey (J. G. J.); Aberdeen (Dawson)! A Shetland specimen measured fully one inch in breadth. F. Antwerp Crag (Nyst); Italy (Scacchi and others).

P. 373.—T. CRASSA, Pennant instead of Gmelin (*T. crassa*, Penn. Br. Zool. iv. p. 87, t. xviii. f. 28). F. Norway (Sars); Rhodes (Mus. J. d. Pl.)! E. Japan (Allcock)!

P. 375.—T. BALTHICA. F. Norway (Sars and others); Prussia (Berendt). E. Holland (Herklots); Naples (Poli and others)!; Madeira, a single valve (Watson)!; N. Japan (Schrenck). *T. rubiginosa*, Poli. Sars considers the *T. grœnlandica* of Beck a variety of this species.

P. 379.—T. TENUIS. E. Denmark, Holland, and France; probably also N. America, as *T. tenera* of Say.

P. 382.—T. FABULA. F. Scandinavia and Italy. E. Holland (Herklots); Atlantic coasts of France and Spain, Med., and Adr.; Cape of Good Hope (Krauss, *fide* Weinkauff). *T. strigilata*, Philippi.

P. 384.—T. SQUALIDA. F. Fairlie near Glasgow (A. Bell)!; Italy (Fonsega and others). E. Kullen in S. Sweden, and Hveen in Denmark (Örsted, as *T. depressa* of Gmelin).

P. 386.—T. DONACINA. F. Fairlie near Glasgow (A. Bell); Antwerp Crag (Nyst, as *Donax striatella* of Brocchi); Italy (Scacchi, Manzoni, and others). Var. *Lantivyi.* Shetland, 18–82 f. Var. *distorta.* Bantry and Dublin bays (Walpole)! F. N.W. Germany (Philippi). A dwarf variety has been found by Professor Stossich at Trieste; it is quite different from *T. pusilla* of the same size.

P. 387, l. 12 from bottom, after "Sic." add "i. p. 39."

P. 388.—T. PUSILLA.

BODY pale yellowish-white: *mantle* slightly protruded; edges minutely and closely ciliated: *tubes* cylindrical and extensile, faintly lineated lengthwise; upper tube much longer than the other; orifices plain; the lower or excretal tube has no valve: *foot* tongue-shaped and flexible.

N. of Hebr., 189 f., living, with bright pink rays (C. and T.); St. Andrew (M'Intosh)! F. Pisa (Manzoni); Monte Mario (Rigacci)! E. Atlantic coasts of France, Spain, and Portugal (Cailliaud, Lafont, M'Andrew, and others)!; Dalmatia (Brusina)!

P. 389, l. 2 from bottom, for "*calcarea*" r. "*calcaria*".

P. 389.—*T. calcaria.* A fine, perfect, and fresh but dead specimen was dredged by the late Dr. Möller (author of the 'Index Molluscorum Grœnlandiæ') off Fair Isle between the Orkneys and Shetland; and I last year got a valve in the same condition on the west coast of Shetland. I must, however, retain my doubts as to its now living in our seas.

P. 392.—PSAMMOBIA TELLINELLA. F. Uddevalla (J. G. J.). E. Morbihan (Taslé)!; Gulf of Gascony (Des Moulins and Lafont)!

P. 394.—P. COSTULATA. Herm, at low water; living. F. Monte Mario (Conti)!; Rhodes (Mus. J. d. Pl.)! E. Atlantic coasts of France and Spain, Med., and Adr. Capt. E. J. Bedford dredged at Oban a specimen an inch in breadth.

P. 396.—P. FERRÖENSIS. F. Macclesfield (Darbishire); Killiney (Walpole)!; Norway (Sars and others). E. Arcachon (Fischer).

P. 398.—P. VESPERTINA. F. Killiney (Walpole)!; Vesuvius (Guiscardi).

P. 402.—DONAX VITTATUS. F. Macclesfield (Darbishire)!; Caithness (Peach)!; Italy, from Pisa to Vesuvius. Var. *nitida*. Sicily (Aradas)! Weinkauff has mistaken this species for the *D. venusta* of Poli, and given it the latter name.

P. 407.—D. TRUNCULUS. E. Nordeney (Grüner, *fide* Dunker); Madeira (Watson)!; not Red Sea. Von Hemprich and Ehrenberg explored not only the shores of the Red Sea, but also the Mediterranean coasts of Egypt and Syria; and the shells which they collected were mixed, and placed in the Museum at Berlin as coming from the Red Sea only.

P. 413.—AMPHIDESMA CASTANEUM. E. Morbihan (Taslé)!

P. 414.—*A. corneum*. E. N. Spain and Portugal (M'Andrew)!

P. 415.—MACTRA SOLIDA. E. Holland (Herklots); Ferrol (Sevane, *f.* Hidalgo); Corunna (M'Andrew)!; Adriatic (Danilo and Sandri, v. Schröckinger, and Stossich). Var. *elliptica*. N. of Hebr., 189 and 530 f. (C. and T.); Arcachon (Fischer); Corunna (M'Andrew)! *M. castanea*, Lam., ex typ. = *M. solida*.

P. 419.—M. SUBTRUNCATA. F. Coralline Crag (S. Wood, as *M. triangulata*, and apparently a variety or monstrosity as *M. obtruncata*); Norway (Sars); Prussia (Berendt). E. Madeira, a single valve (Watson)!

P. 422.—M. TRIANGULA, described by Brocchi, not by Renier.

P. 422.—M. STULTORUM. E. Holland (Herklots); not Red Sea. *M. violacea* and *M. rufa*, Lam., ex typ.

P. 425.—M. GLAUCA. Land's End, fragments only (Lindsay); Jersey (Dodd)! E. Bay of Biscay and Adriatic! Chemnitz cited Born, and thus recognized or identified *M. glauca* as his species. That name was adopted by Gmelin, Schröter, Schreiber, and other authors of the last century, all of whom refer to Born and give the Mediterranean as the habitat.

P. 427.—LUTRARIA. *Lutaria*, Philippi.

P. 428.—L. ELLIPTICA. E. Sweden, in estuaries (Linné); Holland (Herklots); Bay of Biscay (Aucapitaine and Fischer); Adriatic (v. Schröckinger and Brusina). Var. *alterutra*. F. Monte Mario (Conti, as *L. gracilis*)! E. Naples (Acton)!; Algeria (Weinkauff)!

P. 430.—L. OBLONGA. F. Faluns of Touraine (Cailliaud)! E. Sicily (Aradas)!; Dalmatia (Brusina)!

P. 433, l. 12 from top, dele "*Cochlodesma* and".

P. 434, add as synonyms *Lutricola*, sect. A., of De Blainville (1825), and *Calcinella* of Deshayes (1830). If the species which I have placed in the first division of *Scrobicularia* are regarded as constituting a separate genus, Lamarck's old name *Erycina* (as adopted and exemplified by Philippi) ought to be used, and not the modern ill-compounded name *Syndosmya*.

P. 435.—SCROBICULARIA PRISMATICA. F. Norway and Italy. Renier did not describe his *Erycina angulosa*. It is the *Tellina stricta* of Brocchi.

P. 436.—S. NITIDA. Hayle (Hockin)! F. Norway and Italy! E. Loffoden I., 300 f. (Sars); ? Holland (Herklots); Mediterranean, from Spezzia (Doria) to Sicily (Aradas), and Adriatic (Stossich and Brusina)! *Erycina vitrea*, Dan. and S.

P. 438, l. 13 from bottom, for "Panormitan" r. "Palermitan".

P. 438.—S. ALBA. F. Norway, Belgium, and Italy. E. Loffoden I., 300 f. (Sars); Holland (Herklots). *Erycina tumida*, Brusina. Not described by Renier.

P. 442.—S. TENUIS. R. Deben, Suffolk. F. Selsea (A. Bell)! E. Upper Norway (M'Andrew)!; Atlantic coasts of France and Spain, Med., and Adr.! *Erycina Bielziana* and *E. trigona*, Brusina.

P. 444.—S. PIPERATA. F. Scandinavia and N.W. Germany. E. Holland (Herklots); Adriatic (G. v. Martens and others); Japan (Allcock)! Young = *S. fabula*, Brusina. Belon described and figured this shell in 1553 as *Chama piperata*.

P. 446.—Réaumur was of opinion that the presence or comparative length of the tubes in every bivalve mollusk indicates its habits: those, like the present species, which burrow deeply in mud have tubes of extraordinary length; the common cockle, which merely covers itself with sand, possesses very short siphons; while the mussel, which lives on the surface, has none at all.

P. 448.—See note at p. 316 of the 1st volume.

Vol. III. p. 3.—Solecurtus candidus. F. Boulder-clay, Caithness (Peach)!; Monte Mario (Conti and Rigacci)!; Palermo (Aradas)!; Rhodes (Mus. J. d. Pl.)! When this mollusk is laid on its back, the valves are fully expanded, and it is kept in its place by a pair of thread-like muscles, which cross each other as if it were tied in that way.

P. 4, l. 6 from bottom, dele "1."

P. 6.—S. antiquatus. *Psammobia antiqua*, Risso.

P. 10.—Caratisolen legumen. Mersey estuary (Collingwood). F. Vesuvius (Guiscardi).

P. 14.—Solen pellucidus. F. Not Coralline Crag; Monte Mario (Conti)! E. Bay of Biscay (Beltremieux and others)!; Naples (Acton)!

P. 16.—S. ensis. F. N.W. Germany (Philippi); Maine (Packard). E. Norway, from Finmark southwards, shore—10 f. (Sars).

P. 18.—S. siliqua. F. Norway and Italy. E. Norway, from Bergen southwards (Sars). *Ensis magnus*, Schumacher.

P. 23.—Pandora. Dr. Mörch informs me that Hvass was not a German but a Danish justiciary, and that he was for many years secretary to the Danish Embassy at Paris, when Bruguière, Lamarck, and Schumacher (at that time medical students) assembled every week at his house at Auteuil.

P. 24.—P. inæquivalvis, var. *obtusa* or *Pinna*. F. Monte Mario (Rigacci).

P. 25, l. 7 from bottom, for "10" r. "100".

P. 29.—Lyonsia Norvegica. E. N.W. America (P. Carpenter); not Sea of Okhotsk, Middendorff's species being *L. arenosa*.

P. 33.—Thracia. Described by De Blainville in 1825.

P. 34, l. 16 from top, for "*Odoncincta*" r. "*Odoncineta*".

P. 34.—T. prætenuis.

Body clear white: *mantle* pouting at its edges, which are plain: *tubes* short; branchial tube forming a wide slit, and nearly sessile; excretal tube (which is only now and then protruded) longer and conical: *foot* large, lancet-shaped.

F. Monte Mario (Conti and Rigacci)!; Rhodes (Mus. J. d. Pl.)! E. Algeria (Weinkauff)!

P. 36.—T. PAPYRACEA. F. Italy. E. Christiansund (Sars) Var. *villosiuscula*. F. Norway.

P. 38.—T. PUBESCENS. F. Italy. E. Atlantic coasts of France, Med., and Adr.!

P. 39.—T. CONVEXA. F. Monte Mario (Rigacci)! E. Mediterranean, from Mahon to Sicily! *T. Maravignæ* of Aradas and Calcara.

P. 41.—T. DISTORTA. F. Belgium (Nyst). E. Bay of Biscay, Med., and Adr.!

P. 43, l. 3 from top, for "Fleurian" r. "Fleuriau"; and l. 7, for "Récluz" r. "Fleuriau".

P. 45.—POROMYA GRANULATA. The Minch, 45–60 f. (J.G.J.); N. of Hebr., 170 f. (C. and T.). F. N.W. Germany (Leunis, *f.* Philippi). E. Loffoden I., 300 f. (Sars); Dalmatia (Brusina)!

P. 48.—NEÆRA ABBREVIATA.

BODY whitish, with minute flake-white specks: *mantle* closed in front, open on the posterior side for the passage of the foot and admission of water to the gills, as well as on the anterior side, where it is folded into the tubular processes; it has an inner and narrow border of yellow; outside edges fringed with minute points; the lips pout on the posterior side: *tubes* unequal in size and length; the lower or incurrent tube is large and wide, and forms a short cylinder (like a mortar); its orifice is bent inwards and has a ciliated edge; this orifice is sometimes encircled by a ring of an orange colour; excurrent tube conical, with a contracted and small orifice; the tubular sheath has from 6 to 8 long thread-like and finely granulated cirri, with bell-mouthed extremities: *foot* dibble-shaped, narrow, and extensile. Jerks about by means of a systolic and diastolic action of the tubes.

E. Loffoden I., 300 f. (Sars); Loire-Inférieure (Cailliaud); Naples, 60 f. (Acton and Stefanis)!; Sicily (Benoit)!

P. 49.—N. COSTELLATA. N. of Hebr., 189 and 530 f. (C. and T.). F. Monte Mario (Conti)! E. G. Gascony, 60–80 f. (De Folin); Med. and Adr.!

P. 51.—N. ROSTRATA. F. N.W. Germany (Bronn and others); Monte Mario (Rigacci)! E. Loffoden I., 300 f. (Sars); Med. and Adr.!

P. 53.—N. CUSPIDATA. N. of Hebr., 500 and 550 f. (C.

and T.). F. Coralline Crag, Gedgrave, nearly 1¼ × 1 inch (A. Bell)!; Italy, from Pisa to Messina! E. Loffoden I., 450 f. (Sars)!; Asturias and Vigo (M'Andrew)!; Med. and Adr.! A Neapolitan specimen in Dr. Tiberi's rich collection measures 32 millimètres in length. *N. obesa*, Lovén.

P. 56.—CORBULA GIBBA. F. From Christiania to Messina. Weinkauff now refers his *C. rosea* to *C. Mediterranea.*

P. 58.—*C. Mediterranea.* I dredged a small single valve at Guernsey in 1865. Prof. Kröyer found two specimens of *C. ovata* at Christiansund; those which Dr. Mörch gave me were from the collection of Fabricius, and might have come from Greenland or Norway. This form is *C. amurensis* of Schrenck, and perhaps *C. lævis* of Hinds.

P. 64.—MYA ARENARIA. F. N.E. America. E. Brevilacqua in Dalmatia (Danilo and Sandri). Circumpolar. *M. Japonica*, Jay.

P. 66.—M. TRUNCATA. F. Taranto (Costa); Port Kennedy, Greenland (Walker). E. Bay of Biscay (Beltremieux and coll. Fleuriau); Venice (G. v. Martens); Zara, Dalmatia (Dan. and S.). Var. *Uddevallensis.* F. Sicily (Acton)!

P. 70.—M. BINGHAMI. F. Lapugy, Transylvania (Hörnes)! E. Atlantic coasts of France (Récluz and others)!; Ferrol, Spain (Perez Arcas, *f.* Hidalgo); Naples (Scacchi)!

P. 74.—PANOPEA. *Panope*, Mén.

P. 75.—P. PLICATA. Bantry Bay (Walpole and Jordan)!; St. Magnus Bay, Shetland, 60–80 f. (J. G. J.). F. Belfast (A. Bell)!; Monte Mario (Conti, as *Myrina oceanica* and *Arcinella lævis*, and Rigacci)! E. Loffoden I., 300 f., and Bergen (Sars); Danish coast (Mörch); Taranto (Tiberi) and Naples (Costa as *Arcinella carinata* of Philippi)!; Algiers (Weinkauff, as *Sphenia Binghami*). The *Panopæa plicata* of Sowerby's 'Mineral Conchology' is a fossil of the Greensand and Gault formations; his publication was subsequent to that of Montagu.

P. 78.—SAXICAVA NORVEGICA. F. Aberdeenshire (Jamieson); Labrador (Packard). E. Loffoden I., 150 f. (Sars).

P. 81.—S. RUGOSA. N. of Hebr., 170–550 f. (C. and T.). F. Throughout Europe, N. Asia, and America.

E. Loffoden I., 300 f. (Sars). The specific names *rugosa* and *arctica* bear the same date of publication; but the former is the one most generally known. *S. antarctica*, Philippi.

P. 90, l. 12 from top, for "Retz" r. "Philippson"; the reason given for changing the name to *Chæna* is because *Gastrochæna* "aures nostras singulari modo offendit"!

P. 91.—GASTROCHÆNA DUBIA. F. Vienna basin (Hörnes)!; Rhodes and Algiers (Deshayes).

P. 104.—PHOLAS DACTYLUS. F. Killiney (Walpole)!; Ustica I. (Calcara). Costa says that it is very phosphorescent, and that, if its flesh is chewed and kept in the mouth, the breath becomes luminous and looks like a real flame.

P. 107.—P. CANDIDA. F. Macclesfield (Darbishire); Selsea (A. Bell)!

P. 109.—P. PARVA. F. Red Crag (coll. S. Wood, and A. Bell)!; Belgium (Nyst). E. Bay of Biscay (Férussac and others)! *P. callosa*, Lam., ex typ.!

P. 112.—P. CRISPATA. Hayle (Hockin). F. New England (Verrill and Packard); Philippi has since referred his *P. vibonensis* to *Pholadidea papyracea*. E. N. Japan (Schrenck).

P. 116.—PHOLADIDEA PAPYRACEA. Falmouth (Hockin); Woodside, Lancashire (Collingwood). F. Edeghem in Belgium (Nyst)! E. Arcachon (Lafont)!

P. 120.—XYLOPHAGA DORSALIS. Many additional localities on every part of our coasts. F. Vienna basin (Hörnes)! E. Kattegat, Bay of Biscay, Mediterranean, and Adriatic!

P. 121.—In a paper by C. W. Siemens, C.E. (Brit. Assoc. Rep. 1865, p. 187) it is stated that the hemp had "engendered millions of small marine insects of a peculiar kind" (the *Xylophaga*!), and that the deep-sea cable for the Toulon and Algiers line had been destroyed in the same way.

P. 124, l. 3 from top, after "Germans" add "'tremadskr' of the Icelanders, 'jægte-orm' or".

P. 168.—TEREDO NORVEGICA. F. Bordeaux beds, Switzerland, and Vienna basin (Hörnes); Norway (Sars). E. Med. and Adr.! Eaten at Venice, and called "bisse dei legni," G. v. Martens. The sheath is *Septaria Mediterranea* of Risso.

P. 171.—*Dentalium bifissum* belongs to the *Solenoconchia*, and is the type of a genus which I have named *Dischides*; it is also fossil in the Italian tertiaries, and inhabits the Mediterranean, as well as the Gulf of Gascony, the Straits of Gibraltar, and the sea-bed near Teneriffe!

P. 171.—T. NAVALIS. E. Arcachon (Lafont)! Trieste (Stossich)!

P. 174.—T. PEDICELLATA. Arcachon (Fischer)!; Naples (Tiberi and Acton)!; Zara, in the woodwork of the bathing-machines, with *T. Norvegica* (J. G. J.); Algiers (Weinkauff)!

P. 176.—T. MEGOTARA. Uist, Hebrides (M'Intosh)!; Madeira (Watson)!

P. 181.—It does not appear that any of these occasional visitants are alive when they reach our shores, much less that they can thrive and propagate—which, indeed, is not desirable.

P. 181.—*T. malleolus.* Arcachon (Fischer)!; Madeira (Watson)!

P. 182.—*T. bipinnata.* Hayle (Hockin); Faroe I. (Mörch).

P. 184.—*T. minima.* If this be not the Mediterranean species, what is it? In some specimens the pallet-stalks are very long, and the joints are not spinous at the sides.

P. 185.—SOLENOCONCHIA. I overlooked the Rev. L. Guilding's paper in the Transactions of the Linnean Society (xvii., 1834) entitled "Observations on *Naticina* and *Dentalium*, two genera of Molluscous animals," which shows that he had ascertained the true nature and organization of *Dentalium*. Its habits, peculiar mode of locomotion, gills, numerous and elongated tentacles with their suctorial extremities, vermicular foot, and the position of the anal duct were most accurately described by this excellent observer. The late Professor Costa, in his 'Fauna del regno di Napoli,' gave also some details and elaborate figures of its anatomy, but mistook the tentacles for branchial cirri; he noticed the occurrence of Foraminifera in its stomach. I would remark that the thread-like and extensile organs by which the Solenoconchia seize their prey are unlike the tentacles of any Gastropod, and their function is quite different: *captacula* would be a more appropriate term than *tentacula*. The foot is trilobate in the genus *Dentalium* only: in *Siphonodentalium* and *Cadulus* it is dibble-shaped; and when it has penetrated the sand or mud to its full extent, its extremity expands and takes the shape of a round shield or disk, so as to give the animal a fulcrum and enable it to withdraw its shell in the same direction. According to Mr. Jabez Hogg the odontophore of *D. entalis* is a modification of that of the *Chitonidæ*. In the Vidensk. Forh. Christ. for 1858, Prof. Sars regarded this class as an order of Acephala, calling it *Solenoconchæ*. He does not refer to the monograph of Prof. Lacaze-Duthiers, which was published in the preceding year; and it may be presumed that he was not aware of it. It is a curious case of coincidence. Prof. Bronn also distinguished *Dentalium* as the type of a separate class, under the name of Prosopocephala or Scaphopoda.

P. 188, l. 16 from top, for "are bred" r. "issue".

P. 191.—Add Genus I. SIPHO'NODENTA'LIUM*, Sars.

BODY slender: *captacula* numerous: *foot* vermicular and extensile, its extremity being capable of expanding into a disk with a digitated margin and a central spike.

SHELL narrowly funnel-shaped or cylindrical, curved, thin, obliquely but minutely striated in the line of growth, and sometimes ribbed lengthwise: *base* having several notches.

SIPHONODENTALIUM LOFOTEN'SE†, Sars.

S. lofotense, Sars, Malacozoologische Jagttagelser in Vid. Selsk. Forh. 1864, p. 17, t. vi. f. 29–33.

BODY transparent: *captacula* slender.

SHELL somewhat cylindrical, gradually tapering to a narrow point, rather glossy and semitransparent: *sculpture*, fine, close-set and slanting striæ, which constitute the lines of growth: *base* having four slight equidistant notches. L. 0·2. B. 0·025.

HABITAT: Muddy sand in 40–140 f., among the Hebrides and Shetland Isles. Norway, 30–300 f. (Sars); G. Gascony, 60–80 f. (De Folin)!; Naples and Sicily, 50–60 f. (Acton and others)!

The shell differs from the young of *Dentalium entalis* in being more curved and regularly tapering; the mouth and corresponding lines of growth slope backwards instead of being circular, and the base or margin of the posterior orifice is jagged, with two slight notches on each side; the fry has no bulbous point as in *Dentalium*. In some specimens the periodical accretions of growth make them appear jointed.

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* Compounded from its tube-like shape and "*Dentalium*."

† Originally found in the Loffoden Isles.

A specimen of *S. vitreum* was dredged by Carpenter and Thomson in 550 f. off the Faroe Isles; Sars and M'Andrew have recorded it from much less depths on the coast of Norway. *S. affine* of Sars appears to be the young of this species. F. Norway (Sars and others)!; Vienna basin (Hörnes)!

Genus II. CA'DULUS*, Philippi.

BODY resembling that of *Siphonodentalium*.

SHELL awl-shaped, tumid in the middle, and narrower at each end, solid for its size, vitreous, and never exhibiting any sculpture: *mouth* obliquely truncated and thickened: *base* notched.

Gadila, Gray, and *Helonyx*, Stimpson. Rang referred to his genus *Cresis* the genera *Vaginella* of Daudin and *Gadus* of Montagu; but the last named author never proposed any such genus. The type of the present genus is *Dentalium gadus* of Montagu. My friend the Rev. M. J. Berkeley formerly considered it an Annelid and belonging to his genus *Ditrupa* (more properly *Ditrypa*); he is now satisfied that this was a mistake. Species of *Cadulus* are numerous, both recent and fossil. We have only

CADULUS SUBFU'SIFORMIS†, Sars. (*Siphonodentalium subfusiforme*, Sars, Mal. Jagtt. p. 21, t. vi. f. 36–44.)

BODY clear white: *mantle* irregularly fringed at its edges: *captacula* thread-like, unequal in length, and very extensile, annulated in a state of contraction; each has an oval bulb at the extremity: *foot* when at rest tubular, and projecting a little beyond the mouth of the shell, when protruded nearly as long as the shell itself, retractile like the tentacles of a snail or slug; its motion or action is spasmodic and extremely rapid, as well in extension as in withdrawal; disk resembling a daisy, with the encircling lobes or digitations regular but short; this is sometimes concave, and at other times convex; its spike or tentacle is central: *arms* cylindrical, short: *ovary* orange: *liver* brown. The stomach contains microscopic Foraminifera, including *Globigerina* and *Cassidulina*.

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* A little cask.

† Somewhat spindle-shaped.

SHELL somewhat spindle-shaped, proportionally broader (especially in the middle) than in any species of *Siphonodentalium*, nearly straight on the inner or ventral side, and gibbous or arched on the back, becoming suddenly contracted towards the base, where it is much narrower than at the top, very glossy, and transparent: *sculpture* none: *mouth* roundish-oval: *base* flexuous, having two slight curved notches, one on each side; the very young shell has a projecting laminar process at the back. L. 0·15. B. 0·035.

HABITAT: Fine sand near Unst, in 85–140 f., local but not uncommon (J. G. J.); N. of Hebr. 170 and 189 f. (C. and T.). F. Barholmen, near Christiania (Crosskey and Robertson)!; Möllersdorff, Vienna basin (Hörnes)!; Rometta, near Messina (Seguenza)! E. Norway, 50–300 f. (Sars)!; off Bayonne, 60–80 f. (De Folin)!; G. Naples (Acton and Stefanis)!

Dentalium gadus of Montagu (p. 198) belongs to this genus, and not to *Ditrypa*. Barrett dredged it in deep water at Jamaica. *D. coarctatum*, Desh. (a Subapennine fossil), seems to be a distinct species.

P. 191.—D. ENTALIS. N. of Hebr., 170-500 f. (C. and T.). F. Sicily (Tiberi)! Var. *infundibulum*. Shorter and less cylindrical being proportionally wider towards the mouth. Loch Fyne.

P. 195.—D. TARENTINUM. F. Killiney (Walpole)!

P. 196.—*D. dentalis*. E. Morbihan (Taslé).

P. 197.—D. ABYSSORUM. Shetland, 78 and 82 f., two young but living specimens; Hebrides and Skye, apparently semi-fossil; N. of Hebr., 189 and 650 f. (C. and T.). F. Macclesfield (Darbishire)! E. Norway, 30–300 f., and var. as *D. agile* (Sars)!

P. 199.—For "GASTEROPODA" r. "GASTROPODA".

P. 200.—For "PULMONOBRANCHIATA" r. "PULMONIBRANCHIATA".

P. 204, l. 15 from top, for "*Mangelia*" r. "*Pleurotoma*"; and l. 16, for "*Amphisphyra*" r. "*Utriculus*".

P. 209, l. 16 from top, for "valves" r. "scales"; and l. 17, for "calcareous" r. "chitinous".

P. 211.—CHITON FASCICULARIS. F. Selsea (A. Bell)! E.

Dalmatia (Brusina)! In Philippi's collection this species was mixed with *C. discrepans.*

P. 214.—C. DISCREPANS.

BODY lemoncolour: *mantle* faintly tinged with pink, laminar: *head* semicircular: *mouth* star-like or puckered when not engaged in feeding: *foot* elongated, rounded at each end: *gills* yellowish-brown, about 20 on each side, becoming larger towards the posterior extremity; they commence at the middle of the body and extend about halfway down: *duct* large, tubular: *girdle* extremely broad and fleshy, thickly covered with short hairs.

E. Atl. and Med. coasts of Spain (Hidalgo); Zara (J. G. J.).

P. 215.—C. HANLEYI.

BODY pale yellowish-white, tinged with pink: *mantle* thick: *head-lobe* horseshoe-shaped, and narrowly edged with pink: *mouth* large, and puckered: *foot* whitish, microscopically dotted with flake-white; it is truncated or bluntly rounded in front: *gills* extending on each side of the vent or excretal tube, which is conical and prominent: *girdle* underneath thick, greyish, with black specks. The inside of each plate in the middle is strengthened by a thick bow-shaped rib.

F. Norway (Crosskey and Robertson)! E. Loffoden I., 300 f. (Sars); Faroe I. (Mörch); G. Naples, 60 f. (Acton and Stefanis)!; Manan I., Maine (Mighels, as *C. mendicarius*).

P. 217.—C. CANCELLATUS.

BODY yellowish-white: *mantle* rather thin, edged with fleshcolour: *mouth* round and somewhat prominent: *foot* lanceolate, squarish in front, bluntly pointed behind; sole marked lengthwise with 4 fleshcolour lines, the outer broader than the inner ones: *gills* plume-like, short but conspicuous, placed near the tail, 5 on each side.

E. Loffoden I., 300 f. (Sars); Vigo (M'Andrew)!; Dalmatia (Brusina)! Specimens from low-water at Herm are larger than those dredged in the coralline zone.

P. 218, l. 4 from bottom, *C. Rissoi* is a different species.

P. 518.—C. CINEREUS. N. of Hebr., 189 and 530 f. (C. and T.). F. Caithness (Peach)!; Norway (Sars and others)! E. Heligoland (Hoffmann); G. Gascony (Fischer); not Mediterranean. The description given by Fabricius confirms that of Linné in the determination of this species as *C. cinereus.*

P. 220.—C. ALBUS. N. of Hebr. 170–550 f. (C. and T.). E. Labrador, 50 f. (Packard); Wellington Channel (Belcher)!

P. 221.—C. MARGINATUS. F. Selsea (A. Bell)!; Norway (Sars). E. Sicily (Ph., as *C. variegatus*)!; Adr. (Stossich)!

P. 222, l. 12 from bottom, for "the North Sea" r. "Norway".

P. 224.—C. RUBER. F. Clyde beds (Crosskey and Robertson)!; Norway (Sars and others)! E. G. Tartary (Lischke)!

P. 226.—C. LÆVIS. F. Pisa (Manzoni). *C. ruber*, Olivi, and *C. rubicundus*, Costa. Capt. Thomas dredged in Eda Sound, Orkneys, a specimen having only seven plates.

P. 227.—C. MARMOREUS. F. Norway (Sars); Labrador (Packard). E. ?Holland (Herklots); not Carthagena (M'Andrew, who says that perhaps *C. lævis* was intended); Mexico (Brit. Mus.)!; var. probably Sea of Okhotsk (Midd., as *C. submarmoreus*).

P. 229.—*C. siculus*, Gray. F. Selsea (A. Bell)!

P. 235.—PATELLA. Mr. E. R. Lankester says that it is very closely allied to *Chiton*, and has the same peculiar laminated "crop," resembling in structure the psalterium of ruminants. The strength of its conical shell in resisting pressure from above is very great. Burns was scarcely justified in both his similes of an illicit whiskey-still seized by excisemen:—

> "Triumphant crushin't like a mussell
> Or lampit shell."

P. 237, l. 7 from bottom, before "Lamarck" insert "Von Salis and".

P. 238, l. 8 from bottom, after "North" add "and South".

P. 242, l. 16 from top, dele "not".

P. 242.—HELCION PELLUCIDUM. Var. *elongata*. Oblong and smaller. Oban (Leckenby)! The inside of shells belonging to the variety *lævis* often exhibits the mark of muscular attachment above the head in the form of a ledge; occasionally there are two of such ledges, at intervals denoting the different stages of growth.

P. 246, l. 5 from top, for "*Mangelia*" r. "*Pleurotoma*", and for "*Amphisphyra*" r. "*Utriculus*".

P. 246.—TECTURA TESTUDINALIS. Yorkshire coast; two specimens, each 1¼ inch long (Leckenby)! F. Greenland (Walker); Labrador (Packard). E. Jesso I. and G. Tartary (Schrenck); Mexico (Brit. Mus.)!

P. 248.—T. VIRGINEA. N. of Hebr. 530 f. (C. and T.). F. Hope's Nose, Torquay. E. Madeira (Watson)! Not *Ancylus? Gussonii*, Costa.

P. 250.—T. FULVA. Orkneys (Thomas)!; St. Andrews (M'Intosh)!; N. of Hebr., 170 and 189 f. (C. and T.)

P. 252.—LEPETA CÆCA. Skye, a dead specimen (M'Andrew)! F. Labrador (Packard). E. Bay of Castries (Schrenck).

P. 254.—PROPILIDIUM ANCYLOIDES. N. of Hebr., 189 f. (C. and T.). F. Christiania (Crosskey and Robertson)! E. G. Naples, 60 f. (Acton)!

P. 257.—PUNCTURELLA NOACHINA. N. of Hebr., 170 and 189 f. (C. and T.). F. Sicily (Seguenza)!; Labrador (Packard). E. Loffoden I., 250 f. (Sars); Sea of Okhotsk (P. Carpenter); Wellington Channel (Belcher)!; Labrador (Packard).

P. 259.—EMARGINULA FISSURA. N. of Hebr., 189 and 530 f. (C. and T.). F. Bohuslän (Thudén); Messina (Seguenza)! E. Med. and Adr., shore–100 f.!

P. 261.—E. ROSEA. F. N.W. Germany (Ph.); Italy and Rhodes! E. Dalmatia!

P. 263.—E. CRASSA. Anglesea (Miss Roberts, *f.* M'Andrew). F. Trapani, near Messina (Seguenza, as *E. gigantea*)! The dimensions of Red Crag and Sicilian specimens are nearly double what I have given for the recent shell.

P. 265.—*E. Adriatica*, Costa (*E. cancellata*, Ph.). The late Mr. Gallienne found two living specimens at Herm; one of them is now figured as *E. cancellata*. It inhabits the Mediterranean and Adriatic, and is fossil at Messina.

P. 266.—FISSURELLA GRÆCA. F. Vienna basin, Morea, and N. Africa (Hörnes)! E. Naalsoe Sound, Faroe I. (C. and T.). Var. *gibba* (figured as *F. gibba*), Guernsey. Probably Costa was right in referring this variety to the *F. gibberula* of Lamarck. *F. recurvata* of Costa (*F. gibba*, Ph.) is a different species, having much finer and closer sculpture, and a very small slit. The latter species inhabits the Mediterranean and Adriatic, and the Atlantic coasts of France and Spain; it is also a Subapennine fossil.

P. 268.—*F. nubecula.* E. Atlantic coast of Spain (Hidalgo). *F. cinnabarina*, Costa.

P. 268.—CAPULIDÆ. Perhaps this family, as well as *Calyptræidæ*, ought to be placed near *Velutinidæ.* The animal and shell of all these families have many characters in common.

P. 269.—CAPULUS HUNGARICUS. N. of Hebr., 170–530 f. (C. and T.). F. Norway (Sars and others); N.W. Germany (Philippi); Switzerland, Vienna basin, and Morea (Hörnes).

P. 272.—*Piliscus commodus* = *Capulus dilatatus* and *C. depressus* of A. Adams, from Japan.

P. 273.—CALYPTRÆA CHINENSIS. Dublin Bay (M'Calla, *f.* Adair). F. N.W. Germany (Philippi); Switzerland, Vienna basin, and Rhodes (Hörnes).

P. 283.—SCISSURELLA CRISPATA. N. of Hebr., 170 and 189 f. (C. and T.). F. Coralline Crag, Sutton (S. Wood)!; Norway (Sars and others)!; S. Italy (Tiberi and others)!; Rhodes (Mus. J. d. Pl.)! E. Norway, 10–300 f. (Sars). G. Gascony, 60–80 f. (De Folin)!; Mahon (Cardona, *f.* Hidalgo); Labrador (Dawson, *f.* Packard). *S. aspera*, Ph.

P. 287.—CYCLOSTREMA CUTLERIANUM. F. Pezzo, Calabria (Tiberi)! E. G. Naples (Tiberi)!

P. 289.—C. NITENS. N. of Hebr., 189 f., larger than usual, and distinctly striated at the base (C. and T.). F. Monte Mario (Conti)!; Melazzo, Sicily (Seguenza)! E. Loffoden I., 300 f. (Sars); G. Gascony (De Folin)!

P. 290.—C. SERPULOÏDES. N. of Hebr., 530 f. (C. and T.). F. Norway (Sars); Uddevalla (Crosskey and Robertson)! E. G. Gascony (De Folin)!; Med. and Adr.! *Delphinula pusilla*, Calcara. Perhaps Mighel's species was *Skenea planorbis.*

P. 291, last. l., for "Ireland" r. "Iceland". Add:—N. of Hebr., 170 f. (C. and T.); Öxfjord, Finmark, laminarian zone (Sars); Labrador (Dawson, *f.* Packard).

P. 292, l. 6 from top, for "transverse" r. "longitudinal", and add "with a few spiral striæ at the base".

P. 295.—TROCHUS HELICINUS. N. of Hebr., 530 f., dead

(C. and T.). F. Norway (Sars and others). E. Spitzbergen (Phipps); Vancouver's I. (P. Carpenter). A restless little animal, with its lateral filaments incessantly twisting about, like ever watchful sentinels. 11th July, 1867, millions of the fry taken by Mr. Norman in his towing-net at night, swimming on the surface of the water in Balta Sound. Dr. Bergh could not detect any lens in the eye-like tubercles at the base of the filaments. The male appears to be *Margarita campanulata* of Morse.

P. 298.—T. GRŒNLANDICUS. N. of Hebr., 189 and 530 f., dead (C. and T.). F. Caithness (Peach); Norway (Sars and others). E. Faroe I. (Steenstrup); Labrador (Packard). Var. *lævior*. Kyleakin, Skye, with the typical form (J. G. J.); Upper Norway (M'Andrew)!

P. 299.—Add TROCHUS GLAUCUS*, Möller. (*Margarita glauca*, Möll. Ind. Moll. Grœnl. p. 8.)

SHELL globosely conical, rather thin, semitransparent, of a dull hue: *sculpture*, numerous and close-set fine spiral striæ, which are wavy on the body-whorl, and stronger on the upper whorls and the umbilicus: *colour* pale bluish-white: *spire* moderately raised; apex blunt, depressed: *whorls* 4, tumid: *suture* deep: *mouth* circular, sloping towards the base: *outer lip* plain and sharp-edged: *inner lip* folded back a little on the umbilical cavity: *umbilicus* small and narrow, but deep: *inside* nacreous: *operculum* having 8 or 9 volutions, defined by somewhat raised edges, which are white and fringed; centre slightly concave. L. 0·1. B. 0·125.

HABITAT: Dredged by Mr. M'Andrew in about 20–30 f., between Kyleakin and Kyle Rhea in Skye. F. Clyde beds (Brown, as *Margarita olivacea*); Uddevalla (Crosskey and Robertson)! E. Greenland (Möller)!; Davis's Straits (A. Hancock, as *M. Harrisoni*)!; Wellington Channel, 78 f. (Belcher)!; Casco Bay, Maine (Gould, as *M. argentata*)! The last has a coarser sculpture. Arctic specimens are $\frac{1}{3}$ inch in breadth.

P. 304.—*T. cinereus*. N. of Hebr., 170 f. (C. and T.); Skye, perhaps semifossil (Waller)! F. Norway (Sars); Labrador

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* Bluish-grey.

(Packard). E. Norway, 10–130 f. (Sars and others); Labrador, 7–50 f. (Packard); Mexico (Brit. Mus.)!

P. 305.—*T.* (*Margarita*) *elegantissimus.* N. of Hebr., 170 f. (C. and T.). E. N.E. America, as *M. varicosa* of Mighels!

P. 305.—T. MAGUS. E. Dalmatia (Danilo and others); not Red Sea, Forskål's species of this name being different.

P. 307.—T. TUMIDUS. N. of Hebr., 530 and 650 f. (C. and T.) F. Bohuslän (Thudén).

P. 309.—T. CINERARIUS. N. of Hebr., 189 f. (C. and T.). F. I. of Lewis (Sir H. James)!; Bohuslän (Thudén). E. Bay of Biscay (D'Orbigny père and others)! Var. *variegata.* Biarritz (Lischke)!; Corsica (Susini)!; Naples (Tiberi)! This variety is not *Monodonta ægyptiaca* of Payraudeau or *T. fanulum* of Gmelin. *T. cinereus,* Linné, F. S.; *T. inflatus* and *T. lineatus,* De Blainville.

P. 312.—T. UMBILICATUS. Skye and Stornoway (J. G. J.); Hilbie, near Liverpool (Collingwood). F. Portrush (A. Bell)! E. Naples (Acton) and Sicily (Benoit)! The variety *Agathensis* inhabits the lower part of the tidal area, the ordinary or typical form occupying the higher part, and both forms (as well as an intermediate one) occurring halfway between the tide-marks. This species is *T. umbilicalis* of Da Costa.

P. 315.—T. DUMINYI. F. Monte Mario (Rigacci)! E. Atlantic coasts of France, Med., and Adr.! *Solarium Philippii,* Cantraine; this specific name has precedence of *Duminyi.*

P. 317.—T. LINEATUS. F. Selsea (A. Bell)! E. Zara (J. G. J.).

P. 320.—T. MONTACUTI. N. of Hebr., 189 f. (C. and T.). F. Monte Mario (Rigacci)!; Rhodes (Mus. J. d. Pl.)!

P. 322.—T. STRIATUS. F. Italy, from Pisa to Naples.

P. 324.—T. EXASPERATUS.

BODY of a yellowish tinge, dark brown in front, and mottled with purple, yellow, and flake-white: *mantle* having rather large side-lappets; that on the right hand is plain, and the other is minutely notched at its edges: *head* furnished with a nearly cylindrical snout, which is scalloped in front, and with two fringed lobes which lie above the snout, one on each side:

tentacles very long, thread-shaped, and slender, purple, with minute white tuberculous specks: *eyes* prominent, on angular stalks or processes at the outer bases of the tentacles: *foot* lanceolate, rounded in front, and bluntly pointed behind; sole yellowish-white, with a finely notched margin: crest fringed: *appendages* 3 on each side, of a lighter hue than the tentacles.

F. Selsea (A. Bell)!; Italy, from Albengo to Naples. Var. *pyramidata*. Jersey (Dodd)! Apparently *T. venosus*, v. Mühlf., from Morocco.

P. 325.—T. MILLEGRANUS. N. of Hebr., 189 f. (C. and T.). F. Norway, Germany, France, and Italy; not Coralline crag. E. Atlantic coasts of France, and throughout the Med. and Adr. Apex microscopically reticulated.

P. 327.—T. GRANULATUS. F. Monte Mario (Rigacci)!; Naples (Scacchi)! E. Dalmatia!

P. 330.—T. ZIZYPHINUS. N. of Hebr., 189 and 530 f. (C. and T.). F. Switzerland—Rhodes. E. Madeira (Watson)!

P. 333.—T. OCCIDENTALIS. The Minch, 45–60 f., with var. *pura* (J. G. J.); N. of Hebr., 170 and 189 f.; and Faroe I., 10–30 f. (C. and T.).

Two fragments of *Monodonta limbata*, Ph., were dredged by Carpenter and Thomson in 189 f. off the Butt of the Lewis. Sars mentions a specimen having been taken from the stomach of a codfish caught at Bergen. It is a Mediterranean and rather uncommon species.

P. 338.—PHASIANELLA PULLA. The Minch (J. G. J.); Eda Sound, Orkneys, 15 f. (Thomas)! F. Italy, from Pisa to Naples. E. Guadaloupe (Beau, *f.* Petit). *P. tenuis*, Mich., = *P. intermedia*, Ph., appears to be a variety.

P. 343, l. 5 from top, before "including" r. "but not".

P. 346.—LACUNA DIVARICATA. N. of Hebr., 189–650 f., dead and probably drifted (C. and T.). F. Wexford (James)!; Portrush (A. Bell)! E. N. Japan (Schrenck); N.E. America (Conrad and others); Mexico (Brit. Mus.)! *L. arctica*, Ph.

P. 348.—Add L. TENEL'LA*, Jeffreys.

SHELL conic-oval, thin, semitransparent, and glossy: *sculpture*, a few irregular and microscopic spiral lines on the body-whorl, none on the upper whorls: *colour* white, with a tinge of yellowish-brown on the top of the spire: *epidermis* none, perhaps abraded: *spire* turreted, ending in an abrupt and truncated top: *whorls* 5, convex and rounded, gradually enlarging: *suture* deeply excavated: *mouth* more circular than oval, somewhat expanded and angulated at the base: *outer lip* thin, incurved towards the periphery: *inner lip* filmy and scarcely visible: *pillar* curved: *canal* narrow. L. 0·125. B. 0·075.

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* Delicate.

HABITAT: N. of Hebr., in 189 and 650 f. (C. and T.). A very few immature specimens, and one full-sized but broken. May be distinguished from all known species of *Lacuna* by its much smaller size, delicate texture, glossy appearance, turreted spire, truncated apex, deeply excavated suture, and the absence of regular and impressed spiral striæ. Its shape resembles that of *Bithynia Leachii.*

P. 348.—L. PUTEOLUS. Roach river, Essex, and west coast of Shetland (J. G. J.); Orkneys (Thomas)!; N. of Hebr., 530 f., dead (C. and T.). F. Selsea and Portrush (A. Bell)!

P. 351.—L. PALLIDULA. F. Portrush (A. Bell)! Scandinavia (Sars and Thudén). E. Norway, shore–10 f. (Sars); Arcachon (Fischer)! Var. *patula.* Lantivet Bay, Cornwall (Laughrin)!

P. 356.—LITTORINA OBTUSATA. F. Several additional localities in England and Ireland. E. Atlantic coasts of France and Spain, Malaga, Corsica, and Azores! Var. *æstuarii* (figured as *L. æstuarii*):—

BODY pale yellowish, with narrow streaks of brown in front and at the sides: *snout* greyish, thick, extensile: *tentacles* rather long, nearly cylindrical, annulated, with sometimes a dark grey line down the middle in front: *eyes* small, black, placed on oval tubercles or offsets at the outer base of the tentacles: *foot* short, white underneath: *liver* whitish: *fæces* oval, brownish-yellow. Not viviparous.

SHELL smaller than the typical form, uniform greenish-brown (the colour being more or less obscured by the excoriation or decay of the surface); spire more raised and compact; mouth more contracted, outer lip not expanding; sculpture slight and indistinct except in the young. L. 0·4. B. 0·3.

Abundant between tide-marks, on the banks of the river Deben at Shottisham Creek near Sutton, and at Manningtree, Suffolk. A dwarf and depauperated variety of *L. rudis* occurred with it.

P. 358, l. 13 from bottom, for "Broome" r. "Brome".

P. 361.—*L. litoralis.* F. Wexford (James)!; Christiania (Crosskey and Robertson)!

P. 361.—L. NERITOÏDES. F. Belfast and Portrush (A. Bell).

P. 364.—L. RUDIS. N. of Hebr., 189 f., probably transported by a tidal current (C. and T.). F. Norway. E. Med. and Adr.!; Azores, very young specimens (M'Andrew)!; Mexico (Brit. Mus.)! Var. *tenebrosa.* N. Japan (Schrenck). *L. subtenebrosa*, Midd., from the sea of Okhotsk, appears to be another variety of this polymorphous species.

P. 368.—L. LITOREA. E. Toulon Harbour (De Blainville); Lusin I., Adriatic (Grube); Nova Scotia (Stimpson); Mexico (Brit. Mus.)! Perhaps *L. squalida* of Broderip and Sowerby (from the Arctic seas) and *L. grandis* of Middendorff (from the sea of Okhotsk) may be varieties. In old Cornish-English "guihan," Borlase.

P. 377.—Same remark as to the preceding volumes.

Vol. IV. p. 5.—RISSOA STRIATULA. F. Lochgilp glacial bed, Clyde district, with *R. cancellata* (Crosskey and Robertson)!; Selsea (A. Bell)! Probably *Turbo lucullanus*, Scacchi.

P. 7.—R. LACTEA.

BODY milk-white, with minute chalky specks; upper part of the head of a pink hue: *mantle* thick and large; the usual filiform process at the right-hand corner of the mouth of the shell indistinctly appears in the shape of a small tubercle: *head* prominent; lips deeply cloven: *tentacles* rather long, cylindrical but compressed, sparingly covered with very fine cirri, which are more conspicuous at the top; this part is rounded: *eyes* black, very distinct: *foot* lanceolate, broad, squarish in front, with slight auricles or corners, ending in a short pointed tail: *opercular appendage* single, not extending beyond the tail. Timid, although active.

This description was taken from a couple of specimens which I found at Zara under a stone near low-water mark.

P. 8, l. 17 from top, dele parenthesis, and for "of" r. "and".

P. 8.—R. CANCELLATA. F. Lochgilp (Crosskey)!; N.W. Germany (Philippi); Italy, from Pisa to Naples.

P. 11.—R. CALATHUS. E. N. Spain (Fischer, *f.* Hidalgo); Naples and Sicily (Acton and others)!; Dalmatia (Brusina)! *R. subcrenulata*, Schwartz.

P. 11, l. 3 from bottom, for "*abyssicola*" r. "*reticulata*".

P. 12, l. 8 from top, after "latticework" add a pair of raised commas.

P. 12.—R. RETICULATA. F. Clyde beds, Vienna basin, Pisa, and Monte Mario! E. Loffoden I., 300 f. (Sars); G. Gascony, Naples, and Sicily! *R. Mariæ*, D'Orb.

P. 14.—R. CIMICOÏDES. N. of Hebr., 170 and 189 f. (C. and T.). F. Norway and Italy! E. Throughout the Mediterranean! *R. intermedia*, Aradas.

P. 15, l. 14 from top, for "Martin" r. "Malm".

P. 15.—R. JEFFREYSI. Operculum thin, finely and obliquely grooved in the line of growth, and more distinctly towards the spire or nucleus, which is small and placed near the pillar. N. of Hebr., 170 and 189 f. (C. and T.). F. Barholmen near Drobak, Norway (Crosskey and Robertson)! E. Loffoden I., 300 f. (Sars); G. Gascony, 60–80 f. (De Folin)!

P. 17.—R. PUNCTURA. F. Portrush, Italy, and Rhodes! E. G. Gascony, Corsica, and Naples!

P. 19.—R. ABYSSICOLA. E. Loffoden I., 300 f. (Sars); G. Gascony (De Folin)!; Naples (Stefanis)! Not *R. scabra*, Ph.

P. 20.—R. ZETLANDICA. N. of Hebr., 170 and 189 f. (C. and T.). F. Christiania (Crosskey and Robertson)! E. Algeria (Weinkauff)!

P. 22.—R. COSTATA. F. Clyde beds (Robertson)!; Pisa, Monte Mario, and Rhodes! E. Adr.!

P. 23.—R. PARVA and var. *interrupta*. F. Selsea (A. Bell)!; Bohuslän, Monte Mario, and Rhodes! E. Throughout the Med. and Adr.! *R. radiata*, Ph., is probably a variety.

P. 26.—R. INCONSPICUA. F. Belfast (A. Bell)!; Monte Mario (Rigacci)! E. G. Gascony and Naples!

P. 29.—R. ALBELLA. F. Christiania (Crosskey and Robertson)! E. Sicily (Aradas, as *Bithynia Benzi*); Dalmatia (Brusina, as *R. Oenensis*)!

P. 30.—R. MEMBRANACEA. F. Selsea (A. Bell)!; Killiney (Walpole)!; Italy, from Pisa to Naples!

P. 33.—R. VIOLACEA. Cornwall (Hockin)! F. Lochgilp (Crosskey)! [illegible] S. Italy (Fonsega and Calcara).

P. 35.—[illegible]ULATA. Helford (Hockin)! F. Selsea (A. Bell)! E. [illegible] (Brusina)!; Teneriffe (M'Andrew)! Var. *R. decorata*, Ph. In the collection of General Stefanis at Naples I noticed *R. costulata* of S. Wood from Sicily; it may be called *Stefanisi*.

P. 37.—R. STRIATA. N. of Hebr., 170–530 f. (C. and T.). F. Selsea (A. Bell)!; Uddevalla (Crosskey and Robertson)! E. Madeira (Watson and Paiva)!

P. 39.—R. PROXIMA. Hayle (Hockin)!; Shetland, 60–80 f. (J. G. J.). E. Morbihan (Taslé)!; Naples and Sicily (Tiberi and Stefanis)!

P. 40.—R. VITREA. Fleming's specimens are *Odostomia minima*! F. Bohuslän (Thudén); Pisa (Manzoni); Monte Mario (Rigacci)! E. Morbihan (Taslé)!; Sicily (Acton and Stefanis)!

P. 42.—R. PULCHERRIMA. E. Naples and Sicily (Tiberi and Stefanis)!; Zara (Brusina)!

P. 43.—R. FULGIDA. E. Malta (Mamo); Teneriffe (M'Andrew)! *R. Cossuræ*, Calcara, and *R. fasciata*, Caruana.

P. 45.—R. SOLUTA. N. of Hebr., 530 f. (C. and T.). F. Monte Mario (Rigacci)!; Melazzo, Sicily (Seguenza)! E. G. Gascony (De Folin)!; Med. and Adr.! *R. obtusa*, Cantr.; not *R. soluta*, S. Wood.

P. 46.—R. SEMISTRIATA. F. Portrush (A. Bell)! *R. marmorata*, Cantr.

P. 48.—R. CINGILLUS. F. Portrush (A. Bell)! E. Madeira (Watson)!

P. 52.—HYDROBIA ULVÆ. F. Selsea (A. Bell)!; S. Italy (Philippi). E. Adr. and Sea of Okhotsk. *Turbo stagnalis*, Baster; this has precedence of Pennant's name, but may be considered obsolete. Other synonyms include *Melania Charreyi*, Morelet, and *Assiminea gallica*, Paladilhe. The inland habitat given by the last author (salt springs and salt marshes in the Ain and Jura) is remarkable, and may indicate an ancient estuary of the Rhone. Var. *octona*. F. Clacton (A. Bell)!

P. 56.—BARLEEIA RUBRA. F. Pisa (Manzoni); Palermo (Calcara). E. Algeria (Weinkauff)!; Malta ([illegible]).

P. 60.—JEFFREYSIA OPALINA. Orkneys (Tho [illegible]

P. 65.—SKENEA PLANORBIS. F. Uddevalla (Crosskey and Robertson)! Var. *trochiformis*. Specimen almost scalariform. Var. *maculata*. Madeira (Watson)! Var. *hyalina*. Shetland.

P. 69.—HOMALOGYRA ATOMUS. F. Uddevalla (Crosskey and Robertson)! E. Dalmatia (Brusina)!; probably Rimini (v. Mühlfeld, as *Helix nana*).

P. 71.—H. ROTA. Balta Sound (J. G. J.); Dublin Bay (Waller)! F. Grund, Vienna basin (Mus. Vindob.)! E. Lessina, Dalmatia (Mus. Berolin.)!; Madeira (Watson)!; perhaps Rimini (v. Mühlf., as *Helix tricarinata*).

P. 74.—CÆCUM. The Marquis de Folin has given (Journ. Linn. Soc. 1868, x. p. 254) an excellent account of the formation of the septum. He denies its value as a character for the construction of genera, as proposed by Dr. P. Carpenter.

P. 75, l. 11 from top, for "*Odontostoma*" r. "*Odontidium*".

P. 75.—C. TRACHEA. Dublin and Strangford (Waller). F. Pisa (Manzoni). *C. trachea* of Hörnes is *C. mammillatum* of S. Wood. E. Madeira (Watson)! *Orthocera trachea* of Fleming inhabits the West Indies and Singapore, and may have come from a bath-sponge.

P. 77, l. 16 from top, for "*Spirolidium Mediterraneum*" r. "*Dentalium corniculum*"; the former is the fry of *C. glabrum*.

P. 77.—C. GLABRUM. F. Denmark (Mörch). E. Med. and Adr.! The fry is slightly twisted, as in *C. trachea*.

P. 79, l. 5 from top, for "*Odontostoma lævissima*" r. "*Odontidium lævissimum*".

P. 80.—TURRITELLA TEREBRA. F. Throughout Europe.

P. 85.—TRUNCATELLA TRUNCATULA. E. Madeira, with Lowe's species (Watson and Paiva)!

P. 93.—SCALARIA TREVELYANA. E. G. Gascony (Lafont and De Folin)!; Naples, 60 f. (Acton)!

P. 96.—S. CLATHRATULA. F. Monte Mario (Rigacci)! E. Madeira (M'Andrew and Watson)!

P. 98.—*S. pseudoscalaris.* F. Pisa (Manzoni). E. Finisterre (Collard d. Cherres); Atlantic coasts of Spain, Med. Æg., and Azores.

P. 98.—*Acirsa borealis.* F. Uddevalla.

P. 99.—ACLIS, apparently *Niso* of Risso.

P. 100.—A. UNICA. F. Sparebakken, near Skien in Norway (Crosskey and Robertson)!; perhaps Lapugy in Transylvania (Mus. Vindob.)! E. Arcachon (Lafont)!; Naples (Acton and Stefanis)!; Venice (G. v. Martens)!

P. 102.—*Graphis* being used for Lichens, r. "*Cioniscus*".

P. 102.—A. ASCARIS. St. Magnus Bay, Shetland (J. G. J.); Land's End (Hockin)!; Laugharne, not "Bude" (Lindsay); coll. Fleming, as *Turritella subtruncata*! F. Pisa (Manzoni). E. G. Gascony (De Folin)!; Dalmatia (Brusina)! My Shetland specimen has a variciform rib.

P. 103.—A. SUPRANITIDA. Operculum thin, striated in the line of growth; spire small, placed close to the pillar. Orkneys, 35 f. (Thomas)!; W. coast of Shetland, 90–100 f. (J. G. J.); Laugharne, not "Bude" (Linsday); Fowey (Barlee)! F. Norway (Crosskey and Robertson)!; Monte Mario (Rigacci)! E. G. Gascony (De Folin)!; Canaries, 40 f. (M'Andrew)!

P. 105.—A. WALLERI.

BODY clear white with a faint tinge of pink: *tentacles* cylindrical, short: *eyes* close together, sessile on the inner side of the tentacles: *foot* lanceolate.

St. Magnus Bay, Fetlar, and Unst, 40–100 f. E. Loffoden I., 300 f. (Sars); Sicily, 60 f. (Stefanis)! Very variable in size. Apex pinched up, and narrower in proportion to the rest of the spire; mouth as in *A. Gulsonæ.*

P. 106.—A. GULSONÆ. Var. *tenuicula.* St. Magnus Bay.

P. 107.—l. 14 from top, for "Clacton" r. "Sutton".

P. 107.—*Menippe* has been already employed in the Crustacea. Substitute *Pherusa.*

P. 115.—ODOSTOMIA MINIMA. St. Magnus Bay, 60–80 f. (J. G. J.); coll. Fleming, as *Rissoa vitrea* (vide supra, p. 208)!

P. 116.—O. NIVOSA. St. Magnus Bay (J. G. J.); Haroldswick, not "Hillswick."

P. 117.—O. TRUNCATULA. E. G. Gascony (De Folin)!

P. 118.—O. CLAVULA. St. Magnus Bay (J. G. J.); Cumbrae and Falmouth (Norman). E. G. Gascony (De Folin)!; Naples (Tiberi and Acton)!

P. 120.—O. LUKISI. F. Pezzo, Calabria (Tiberi)! E. Sicily (Tiberi)!; Dalmatia (Brusina)!

P. 121.—O. ALBELLA. E. Venice (G. v. Martens, as *Turbo hyalinus*)!; Dalmatia (Brusina)!

P. 122.—O. RISSOÏDES. N. of Hebr., 530 f. (C. and T.). F. Pezzo (Tiberi)! Var. *exilis*. St. Magnus Bay.

P. 123, l. 6 and 7 from bottom, reverse ff. 2 and 3.

P. 124.—O. PALLIDA. F. Selsea (A. Bell)!; Pisa (Manzoni). *Turritella potamoides*, Cantr.

P. 127.—O. CONOÏDEA. F. Throughout Europe. *Rissoa plica*, Cantr., and *Auricula nitida*, G. v. Martens!

P. 129.—O. UMBILICARIS. St. Magnus Bay. E. G. Naples, 60 f. (Acton)!

P. 130.—O. ACUTA. E. Sicily (Tiberi)!; Dalmatia (Brusina)!

P. 132.—O. CONSPICUA. Orkneys (Thomas)! E. Loffoden I., 300 f. (Sars)!; Corsica (Tiberi)!

P. 134.—O. UNIDENTATA. N. of Hebr. 170–530 f. (C. and T.). F. Portrush (A. Bell)!; not *O. unidentata*, Ph. E. G. Gascony (De Folin)!; Madeira (Watson)! Monstr. Each whorl keeled in the middle. St. Magnus Bay.

P. 135.—O. TURRITA. N. of Hebr., 189 and 530 f. (C. and T.). F. Clyde Beds and Norway (Crosskey and Robertson)! E. Dalmatia (Brusina)!; Madeira (Watson)!

P. 137.—O. PLICATA. F. Selsea (A. Bell)!; Vienna basin and Italy! E. G. Gascony, Naples, and Sicily! *Eulima bulimus*, Scacchi. Not *O. vitrea*, Brus., which is *O. neglecta*, Tib.

P. 139.—O. INSCULPTA. N. of Hebr., 189 and 530 f. (C. and T.). E. Loffoden I., 300 f. (Sars); G. Gascony (De Folin)! Var. *tumida*. Shell broader and less slender, the body-whorl being larger in proportion to the others. Olnafirth Voe, Shetland.

P. 141.—O. DIAPHANA. E. G. Gascony (De Folin)!

P. 142.—O. OBLIQUA. F. Uddevalla (Crosskey and Robertson)! E. Quibéron, Brittany (Taslé)!; G. Naples (Stefanis)!; Dalmatia (Brusina)!

P. 143, for var. *Warreni* substitute

O. WARRE'NI*, Thompson.

BODY whitish, having a closely veined structure when examined microscopically: *mantle* folded at the upper corner of the mouth of the shell: *snout* rather short, deeply bilobed: *tentacles* leaf-like and proportionally large: *eyes* minute, close together at the inner base of the tentacles: *foot* large, double-edged and slightly auricled in front, deeply notched and bilobed behind; these lobes are equal in length and size, and resemble the tail of a swallow.

SHELL more slender than *O. obliqua*, covered with very numerous microscopic spiral striæ, those at the base being much stronger and more conspicuous, the apex obliquely truncated, and the umbilicus deep. L. 0·1. B. 0·05.

HABITAT: Muddy sand, 50–80 f., N.E. and W. coasts of Shetland. E. Naples, Taranto, and Sicily (Tiberi and Stefanis)! See also localities given in p. 143. Animal remarkable for the forked extremity of the foot. It swims or floats, like other small Gastropods, under the surface of the water; in which position the tentacles and lobes of the snout are not unlike those processes in *Jeffreysia*. One individual spun a delicate glutinous filament from the foot, and kept itself suspended for some time in the water, with the point of the shell downwards. *O. acicula* has the same habit.

P. 144.—O. DOLIOLIFORMIS. E. G. Naples (Stefanis)!

P. 145.—O. DECUSSATA. F. Monte Mario (Rigacci)! E. G. Gascony (De Folin)!

P. 148.—O. CLATHRATA. F. Vienna basin (Mus. Vindob.)!; Monte Mario (Rigacci)! E. Algeria (Weinkauff)!; G. Naples (Stefanis)!; Dalmatia (Brusina)!

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* Named in compliment to the late Mr. T. W. Warren of Dublin, an assiduous conchologist.

P. 149.—O. INDISTINCTA. F. Vienna basin, and Italy! E. Arcachon (Lafont)!; Algeria (Weinkauff)!; Venice (G. v. Martens)!; Dalmatia (Brusina)!; Madeira (Watson)! I have a specimen from the Mediterranean, which is furnished with a slight tooth-like fold on the pillar.

P. 151.—O. INTERSTINCTA. N. of Hebr., 189 f. (C. and T.). E. Med. and Adr.! Var. *terebellum.* F. Vienna basin and Italy! E. Med. and Adr. *Strombus obliquatus,* v. Mühlf., *Auricula striata,* G. v. Martens, and *Truncatella exilis,* Menke. Var. *suturalis.* F. Selsea (A. Bell)!

P. 154.—O. SPIRALIS. F. Portrush (Portlock and A. Bell); Monte Mario (Rigacci)! E. G. Gascony (De Folin)!; Adriatic (Stossich)!

P. 155.—O. EXIMIA. N. of Hebr., 170 and 189 f. (C. and T.); St. Magnus Bay and Unst, 45–100 f. (J. G. J.). Apex sometimes truncated.

P. 156.—O. FENESTRATA. F. Italy and Rhodes! E. G. Gascony (De Folin)!; G. Naples (Stefanis)! *Chemnitzia Rigacci,* Conti.

P. 158.—O. EXCAVATA. F. Largs, Ayrshire (Landsborough); Monte Mario (Rigacci, as *Rissoa trinodosa* of Rayneval)!; Rhodes (Mus. J. d. Pl.)! E. G. Gascony (De Folin)!

P. 160.—O. SCALARIS. Unst. F. Italy. E. Madeira (Watson)! Var. *rufescens.* N. of Hebr., 189 f. (C. and T.).

P. 162.—O. RUFA. F. Italy! *Parthenia fasciata,* Forb., is probably the young.

P. 164.—O. LACTEA. F. Belfast and Selsea (A. Bell)!; Vienna basin (Hörnes)!; Rhodes (Mus. J. d. Pl.)!

P. 167.—O. PUSILLA. Birterbuy Bay (Walpole)! F. Vienna basin, Italy, the Morea, and Rhodes! E. Dalmatia (Brusina)!

P. 169.—O. SCILLÆ. N. of Hebr., 170 f. (C. and T.). F. Norway, Vienna basin, and Italy! E. G. Naples (Stefanis)! Var. *compactilis.* St. Magnus Bay,

P. 170.—O. ACICULA. F. Norway and Italy! E. Loffoden I., 300 f. (Sars). I have a specimen from the Gulf of Naples, which exhibits a conspicuous tooth. Var. *ventricosa*:—

BODY clear white, with a somewhat frosted appearance: *snout* (or mentum) long and narrow, deeply bilobed in front, and divided down the middle: *tentacles* triangular, rather short, with blunt tips: *eyes* very small, approximative, on the inner base of the tentacles: *foot* long, squarish and double-edged in front, with a slight auricle or triangular expansion at each corner, and terminating behind in a rounded point. Liver orange. Animal active, crawling rapidly out of the water. It does not occupy the nucleus or reversed apex of the shell.

N. of Hebr., 170 and 189 f. (C. and T.). F. Pisa (Manzoni); Monte Mario (Rigacci)! E. Naples (Tiberi and Stefanis)!

P. 173.—O. NITIDISSIMA. F. Calabria (Tiberi)! E. G. Gascony (De Folin)!; Naples (Acton)!; Nona, Dalmatia (Brusina)!

P. 186.—IANTHINA ROTUNDATA. Dunnet Head, Caithness (Thomas)! E. Arcachon, living (Lafont)!; Naples (Scacchi and others)!; Sicily (Aradas)!

P. 191.—Some species of *Stilifer*, however, are truly parasitic. Prof. Semper observed them living and crawling about in the stomachs of *Holothuriæ*; and one species was found by F. Jagor within the excretory canal of *H. glaberrima*, its foot penetrating deeply into the fleshy walls of the canal, and the shell being surrounded by a cup-like expansion of the mantle.

P. 193, l. 3 from top, for "*Mangilia*" r. "*Pleurotoma*".

P. 195.—STILIFER TURTONI. Falmouth (Hockin)!; Unst, 40–50 f. (J. G. J.).

P. 197, l. 13 from top, for "*Caligus*" r. "*Lernæa*".

P. 201.—EULIMA POLITA. F. Upper tertiaries of Germany, France, Italy, and Greece southwards to Rhodes (Hörnes).

P. 203.—E. INTERMEDIA. Birterbuy Bay (Walpole)! F. Norway, N.W. Germany, and Italy! E. Loffoden I., 300 f. (Sars). Var. *rubro-tincta*, Adriatic (Stossich)!

P. 205.—E. DISTORTA. F. Pisa—Rhodes! E. Loffoden I., 300 f. (Sars). *E. sinuosa*, Scacchi, and *E. Philippii*, Weinkauff. This may be one of the few surviving or unaltered forms of the older tertiaries. Var. *gracilis*. E. Naples (Tiberi)!; Dalmatia (Brusina)!

P. 207.—E. STENOSTOMA. E. Loffoden I., 300 f. (Sars).

P. 208.—E. SUBULATA. F. Pisa (Manzoni); Monte Mario (Rigacci)!; not Vienna basin! Dr. Tiberi found at Naples a dwarf form, which has the usual slender shape and coloured markings; it shows that size is not the only character which distinguishes this species from *E. bilineata*.

P. 210.—E. BILINEATA. N. of Hebr., 170 and 189 f. (C. and T.). F. Norway (Crosskey and Robertson)! E. Loffoden I., 300 f. (Sars); G. Gascony (De Folin)!; G. Naples (Acton)!; Adriatic (Brusina)!

P. 214.—NATICA ISLANDICA. N. of Hebr., 189 f. (C. and T.); St. Andrews (M'Intosh)!

P. 216, l. 6 from top, for "Edwards" r. "Edward".

P. 216.—N. GRŒNLANDICA. N. of Hebr., 189 and 650 f. (C. and T.); Skye (M'Andrew)! F. Belfast (A. Bell)!; Labrador (Packard); New England (De Laski).

P. 217, l. 12 from bottom, for "south-west" r. "north-west."

P. 218.—N. SORDIDA. Probably *N. fusca*, De Blainville (Dict. Sc. Nat. t. 32, p. 252; name only).

P. 220.—N. CATENA. Off Balta Sound, 40–50 f. (J. G. J.); off Fair Isle, 45 f. (Thomas)! F. N.W. Germany and Rhodes. E. G. Naples (Acton and others)!; Sicily (Aradas and others)!; Taranto (Costa). *Nerita helicina*, Brocchi.

P. 224.—N. ALDERI. F. Gottenburg (Malm). *N. Poliana*, D. Ch. Var. *ventricosa*. Birterbuy Bay (Walpole).

P. 227.—N. MONTACUTI. N. of Hebr., 189 f. (C. and T.). F. Bohuslän (Thudén); Sicily (Tiberi and Seguenza)!; Rhodes (Mus. J. d. Pl.)! E. Loffoden I., 250 f. (Sars). Mr. Waller found two young specimens of a scalariform monstrosity in dredged sand from St. Magnus Bay.

P. 229.—N. AFFINIS. N. of Hebr., 189 f. (C. and T.); figured. E. Loffoden I., 300 f. (Sars). *N. occlusa* of S. Wood, from the Bridlington deposit, is apparently a large form of this species. Recognizable by the thick pad, which completely covers the umbilicus, and by its calcareous operculum.

P. 231.—ADEORBIS SUBCARINATUS. Herm, a live specimen under a stone between tide-marks, with *Rissoa striatula* (Marshall)! He noticed that the animal was very large in proportion to the shell, and so red that it seemed to stain his fingers. Philippi describes the animal of his *Solarium luteum*, even when dead, as "coccineum." The operculum of Mr. Marshall's specimen agrees with my description. F. Selsea and Portrush (A. Bell)! E. Med. and Adr.! *Delphinula pusilla*, Calcara.

P. 235.—LAMELLARIA PERSPICUA. F. Monte Mario (Conti). E. Labrador, 15 f. (Packard). Var. *lata* :—

BODY whitish : *mantle* closely and minutely tessellated, with milk-white lines of division; it is not pustulated: *pallial sinus* or notch narrow and deep: *tentacles* awl-shaped: *eyes* black: *foot* lanceolate, truncated and double-edged in front, with short angular corners, bluntly pointed behind.

L. prodita of Lovén probably inhabits the coast of Shetland as well as that of Scandinavia. Last summer (1868) I dredged in 110 f. off Unst a *Lamellaria* of an unusually large size, more than an inch long; but unfortunately it was handled too roughly, and the shell was broken to pieces. According to Lovén, the mantle in this species is depressed, with the notch somewhat to the left; the shell is elongated and opaque, exhibiting coarse lines of growth; and the spire is minute, occupying only $\frac{1}{5}$ of the shell.

P. 240.—VELUTINA LÆVIGATA. N. of Hebr., 170–530 f. (C. and T.). Var. *tenuis*. Thinner, and having fewer ridges. Shetland, 78 f.

P. 245.—TRICHOTROPIS BOREALIS. N. of Hebr., 530 f. (C. and T.).

P. 248.—*Admete viridula*. N. of Hebr., 550 f. "cold area" (C. and T.). F. Norway and Labrador. E. Loffoden I., 300 f. (Sars).

P. 250.—APORRHAÏS PES-PELECANI. N. of Hebr., 189 f. (C. and T.).

P. 253.—A. MACANDREÆ. St. Magnus Bay, W. coast of

Shetland, 60–80 f. F. Palermo (Seguenza and Benoit)! E. Loffoden I., 250 f. (Danielssen, *f.* Sars).

P. 256.—CERITHIUM METULA. Fair Isle (Möller)!; N. of Hebr., 170 and 189 f. (C. and T.). E. Loffoden I., 300 f. (Sars).

P. 258.—C. RETICULATUM. Orkneys (Thomas)! F. Throughout Great Britain and Europe. E. Madeira (Watson)!

P. 261.—C. PERVERSUM. St. Magnus Bay; Fair Isle (Möller)! F. Portrush (A. Bell)!; Christiania—Cyprus! Extremely variable in size; both the large and small forms occur in Sicily and Dalmatia.

P. 264.—*C. tuberculatum.* Mr. Dodd found a small specimen at Herm; and M. Cailliaud records a variety (*C. Mediterraneum*, Desh.) as living at Pornichet in the Loire-Inférieure.

P. 266.—CERITHIOPSIS TUBERCULARIS. Orkneys (Thomas)!; N. of Hebr., 189 f. (C. and T.). F. Portrush (A. Bell)!; Christiania—Rhodes! Dr. Tiberi found specimens of different sizes living with *Modiolaria marmorata* in the tunic of *Ascidia mentula* at Naples. This indicates a parasitic habit. Monstr. *Clarkii.* Dalmatia (Brusina, as *C. bilineata*)!

P. 268.—C. BARLEEI. The operculum has a very short spire. Wexford coast, 40 f. (Walpole)! E. Arcachon (Lafont)!; G. Naples (Tiberi)!; Sicily (Stefanis)!

P. 269.—C. PULCHELLA. Spire of the operculum small and resembling a *Cristellaria*. *Mathilda margaritula*, Semper, a tertiary fossil of Lapugy in Transylvania, may be this species.

P. 271.—C. METAXA. F. Pisa (Manzoni); Rhodes (Mus. J. d. Pl.)! E. Dalmatia (Brusina, as *C. acicula*)!

P. 272.—C. COSTULATA. N. of Hebr., 170 and 189 f. (C. and T.). E. Loffoden I., 300 f. (Sars). Not my *C. nivea*, which I have now ascertained to be a *Cerithium*; Carpenter and Thomson dredged a living specimen of it in 550 f. between the Outer Hebrides and the Faroe Isles.

P. 276.—PURPURA LAPILLUS. N. of Hebr., 530 f., dead (C. and T.). F. Bohuslän (Thudén); New England (Hamlin, *f.* Packard). E. Minorca (Ramis, *f.* Hidalgo). Var. *imbricata.* Hayle (Hockin).

P. 279, l. 9 from top, for "siliceous" r. "chitinous".

P. 281, l. 12 from bottom, after "Wick" add "and Mawgan Porth in Cornwall".

P. 283, l. 13 from bottom, dele *B. anglicanum* of Lamarck, which is a Cape-of-Good-Hope species of *Purpura*.

P. 285.—Buccinum undatum. F. Calabria and Sicily (Tiberi)! Var. *Zetlandica*. N. of Hebr., 500–650 f. (C. and T.).

P. 293, l. 5 from top, dele *B. porcatum* of Gmelin, which is a Cape-of-Good-Hope shell, his variety being Mexican.

P. 293.—B. Humphreysianum. St. Magnus Bay. F. Calabria (Tiberi)!; Palermo (Seguenza)!

P. 298.—Buccinopsis Dalei. N. of Hebr., 189 f. (C. and T.).

P. 301.—Triton nodifer. F. Monte Mario (Rigacci)! E. Japan (Dunker, as *T. Sauliæ* of Reeve)! Prof. Panceri gives this species as one of the Gastropods which secrete sulphuric acid from their salivary glands.

P. 303.—T. cutaceus. F. Taranto (Costa). *T. heptagonum* of S. Wood, from the Coralline Crag at Gedgrave, seems to be this species, and not *Murex heptagonus* of Brocchi. E. Trieste (Stossich)!

P. 306.—Murex erinaceus. F. Transylvania to the Morea (Hörnes). E. Holland (Herklots); Adriatic (Grube). Var. 1. *sculpta*. Morbihan (Taslé). Var. 2. *melanostoma*. Black-mouthed. Jersey (Dodd)! *M. tortuosus*, S. Wood, from the Red and Coralline Crag, may be another variety.

P. 310.—M. aciculatus. F. Pisa (Manzoni).

P. 313.—Lachesis minima. F. Rhodes (Mus. J. d. Pl.)!

P. 316.—Trophon muricatus. F. Calabria and Sicily (Philippi). E. Dalmatia (Brusina)!

P. 318.—T. Barvicensis. N. of Hebr., 170 f. (C. and T.). F. Norway (Crosskey and Robertson)! E. Loffoden I., 300 f. (Sars).

P. 319.—T. truncatus. N. of Hebr., 189 and 530 f. (C. and T.).

P. 323.—Fusus antiquus. E. Arcachon (Lafont)!

P. 328.—*F. despectus*. F. Bohuslän (Thudén). E. Faroe I. (Mörch); N. Japan (Nordmann, *f.* Schrenck).

P. 329.—F. Norvegicus. N. of Hebr., 189 f. (C. and T.). F. Red Crag, Butley (A. Bell)!

335.—F. GRACILIS. N. of Hebr., 170–530 f. (C. and T.). F. Belfast (Bryce and Hyndman); Norway (Crosskey and Robertson)! E. Ostend (Otker, *f.* Dunker)!; Arcachon (Lafont)!

P. 338.—F. PROPINQUUS. St. Andrew (M'Intosh)!; N. of Hebr., 189–530 f. (C. and T.); not Dublin Bay, nor Cork, which localities belong to the next species. E. Loffoden I., 250 f. (Sars).

P. 340, for "F. BUCCINATUS, Lamarck" substitute "F. JEFFREYSIANUS, Fischer". Not Lamarck's species, which inhabits Senegal and is the "Rafel" of Adanson. See 'Journal de Conchyliologie' for January 1868. E. Arcachon (Lafont)!

P. 341.—F. BERNICIENSIS. N. of Hebr., 189 and 550 f. (C. and T.). E. Arcachon, a dead but fresh specimen dredged in the Gulf of Gascony (Lafont)!

P. 344.—*F. latericeus.* F. Uddevalla.

P. 349.—NASSA NITIDA. Falmouth (Norman). F. Monte Mario (Rigacci)! E. Med. and Adr., with *N. reticulata*!

P. 351.—N. INCRASSATA. N. of Hebr., 189 f. (C. and T.). F. Europe, southwards to Rhodes! Var. *simulans.* F. Red Crag, Butley (A. Bell)!

P. 354.—N. PYGMÆA. F. Killiney (Walpole)! E. Helsingborg (Mörch); Dalmatia (Brusina)!

P. 356.—COLUMBELLA HALIÆETI. N. of Hebr., 170–650 f. (C. and T.). F. Messina (Seguenza)! E. Naalsoe, Faroe I. (C. and T.). Var. *albula.* White. Unst.

P. 359.—C. NANA. N. of Hebr., 189 f. (C. and T.). F. Christiania (Crosskey and Robertson)!

P. 360.—*C. Holböllii.* N. of Hebr., 170 f. (C. and T.).

P. 361.—DEFRANCIA = *Raphitoma*, Bellardi.

P. 362.—D. TERES. N. of Hebr., 189 f. (C. and T.). F. Coralline Crag, Sutton, young (S. Wood, as *Trophon paullulum*)!; Christiania (Crosskey and Robertson)!; Monte Mario (Rigacci)! E. Loffoden I., 250 f. (Sars); G. Gascony (Lafont and De Folin)!

P. 363.—D. GRACILIS. F. Piedmont (Bellardi).

P. 366.—D. LEUFROYI. N. of Hebr., 170 f. (C. and T.)

The animal is sometimes of a pea-green colour. *Pleurotoma C.*, Costa, and *P. volutella*, Valenc.

P. 368.—D. LINEARIS. F. Portrush (A. Bell)!; Coralline Crag (S. Wood; the specimens in his collection named "*Clavatula linearis*" belong to his species *perpulchra*); Bohuslän (Thudén).

P. 370.—D. RETICULATA. F. Bordeaux (Des Moulins). Var. *formosa*. G. Naples (Stefanis, as *Pleurotoma hystrix* of Bellardi)!; Adriatic (Stossich)! Young=*P. spinosa*, De Bl. Renier did not describe this species; and the names given by Brocchi and J. Sowerby therefore have precedence. But "quieta non moveri" is a good maxim in cases like this.

P. 373.—D. PURPUREA=*Pleurotoma cornea*, De Bl. Var. *Philberti*=*P. Laviæ*, Maravigna. Des Moulins rightly called such species-making "cette hydre de la synonymie qui étouffe et dévore la science."

P. 375, l. 10 from bottom, after "*P. nivalis*" add "and *P. carinata*"; and, next line, for "has" r. "have".

P. 376.—PLEUROTOMA STRIOLATA. F. Pisa (Manzoni). E. Arcachon (Lafont)!; Adriatic! *Buccinum Citharæ*, v. Mühlf., and probably *Mangelia costulata*, Risso.

P. 377.—P. ATTENUATA. F. Pisa (Manzoni); Monte Mario (Rigacci)! Not *P. nuperrimum* of Tiberi.

P. 379.—P. COSTATA. F. Piedmont (Bellardi); Monte Mario (Rigacci)! E. G. Naples (Acton and Stefanis)!; Dalmatia, 20–30 f. (Brusina)! Not *P. tæniata*, Desh.

P. 381.—P. RUGULOSA. Birterbuy Bay (Walpole)! F. Vienna basin—Rhodes! E. Arcachon (Lafont)! Several obsolete synonyms.

P. 382.—P. BRACHYSTOMA. F. Coralline Crag, Sutton; N.W. Germany (Philippi); Pisa (Manzoni).

P. 384.—P. NEBULA, var. *elongata*. Coast of Kerry, 25 f. (Moore, *f.* Walpole)! E. Arcachon (Lafont)!

P. 386.—P. LÆVIGATA. F. Cor. Cr., Sutton (coll. S. Wood)!

P. 388.—P. NIVALIS. N.N.W. of Unst, 90–120 f.; N. of Hebr., 170 f. (C. and T.). F. Cor. Cr. Gedgrave (S. Wood, as *P. porrecta*). E. Loffoden I., 300 f. (Sars). The male organ is ribbon-shaped and of an extraordinary length; the pallial tube extends further than in *P. carinata.* Sars proposed for the present species the generic name of *Typhlomangelia,* on account of its being eyeless. But *Eulima stenostoma* is another instance of blindness among species usually provided with organs of sight.

P. 390.—A fresh but dead specimen of *P. galerita,* Ph. (*P. galeritum,* Moll. Sic. ii. p. 172, t. xxvi. f. 15) was dredged by Carpenter and Thomson in 189 f., about 50 miles N. of the Butt of the Lewis. It is a very rare Calabrian fossil. See pl. cii. f. 6.

Add P. CARINATA*, Bivona.

P. carinata, Biv. Gen. et Spec. Moll. p. 12.

BODY creamcolour: *pallial tube* short: *tentacles* cylindrical, short, and slender: *eyes* black, small but very distinct, placed on the top of the stalks or ommatophores, which are united with the tentacles and are one-half of their length: *foot* proportionally large, almost equally broad throughout, squarish in front, and bluntly pointed behind.

SHELL columnar, solid, opaque, porcellanous, and somewhat glossy: *sculpture,* a blunt keel in the middle of each whorl, besides microscopic and close-set flexuous lines on the upper part above the keel: *colour* milk-white: *spire* gradually tapering to a blunt point: *whorls* 9, strongly angulated in the middle, and somewhat excavated below the suture; the last whorl occupies about one-half of the shell: *suture* slight, but well defined: *mouth* irregular, pear-shaped; length about one-third of the shell: *canal* short, very wide and open, bending a little to the left: *outer lip* rounded from the labial notch to the base, with a sharp edge: *labial notch* broad, deep, and remarkably distinct, with its upper edge thickened; it is placed in the middle of the space above the keel: *inner lip* thickened above, and consisting below of a thin glaze, which extends to the canal: *pillar* broad and flexuous: *operculum* pear-shaped, solid, and of a purplish colour; it is small compared with the size of the mouth, and is withdrawn into the shell when the animal is alarmed or dead. L. 0·8. B. 0·25.

HABITAT: N.N.W. of Unst, pebbly ground, 120 f., one living and one dead specimen; N. of Hebr., 189 f. (C. and T.). F. Red and Cor. Cr.; very rare (S. Wood and Alexander). E. Calabria; rare (Bivona and Philippi). Bellardi gives also

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* Keeled.

Piacenza and the Vienna basin, regarding this species as the *Fusus modiolus* of Jan; and he cites Sismondi for another synonym, *P. acuta*, Bellardi. But Jan's name is taken from a catalogue only, and I am not aware that he ever described the shell; and Bellardi's description certainly does not suit our species, which is not varicose, nor is the canal striated. E. Norway, 30–300 f. (M'Andrew and Sars). The animal is much more shy and easily alarmed than *P. nivalis*, which lives with it.

P. 390.—P. SEPTANGULARIS. F. Belfast (A. Bell)!; N. of Italy (Bellardi and Manzoni). Not *P. Bertrandii*, Payr.

P. 392.—P. RUFA. F. Red Crag at Butley, Selsea, and Portrush (A. Bell)!; Killiney (Walpole)!; G. Naples (Tiberi and others)! *P. rufescens*, De Bl.

P. 394.—*P. pyramidalis*. F. Killiney (Walpole)! *Fusus rufus*, Gould.

P. 395.—P. TURRICULA. N. of Hebr., 550 f. (C. and T.). F. Labrador (Packard, as *Bela exarata*). E. Arcachon (Lafont)!; Labrador, 4–30 f. (Packard). Montagu's and Donovan's names were published in the same year, 1803.

P. 398.—P. TREVELYANA. N. of Hebr., 189 f. (C. and T.). Not *Fusus decussatus*, Couthouy, which has flexuous ribs and a much finer sculpture; this has been dredged by Carpenter and Thomson in 500 and 550 f., between 60° and 61° N. lat., and by G. O. Sars in 300 f. among the Loffoden Isles.

P. 400.—MARGINELLA. Deshayes and Philippi have since separated *Erato* from this genus.

P. 403.—CYPRÆA EUROPÆA. N. of Hebr., 189–530 f. (C. and T.).

P. 407.—OVULA PATULA. Wexford coast, 40 f. (Walpole). E. G. Naples (Tiberi)! Probably *Simnia Nicæensis* and *S. purpurea*, Risso; not *O. carnea*.

P. 411.—CYLICHNA ACUMINATA. F. N.W. Germany (Philippi). E. Brittany (Taslé); G. Gascony (Lafont and De Folin)!

P. 412.—C. NITIDULA. F. Christiania (Crosskey and Robertson)! E. Danish coast (Mörch); Brittany (Delaunay, *f.* Taslé); G. Gascony (De Folin)!; G. Naples (Stefanis)!

P. 413.—C. UMBILICATA. F. Vienna basin (Hörnes)! E. and var. *conulus*. Loffoden I., 300 f. (Sars). Not var. *conulus* of Weinkauff, which he has since named *C. Hoernesi*; this is the *C. pyramidata* of A. Adams.

P. 417.—C. ALBA. N. of Hebr., 189 and 530 f. (C. and T.). E. Loffoden I., 300 f. (Sars).

P. 419, l. 9 from bottom, before "distinct" insert "usually".

P. 420.—UTRICULUS MAMMILLATUS. Orkneys (Thomas)! F. Monte Mario (Rigacci)! E. Madeira (Watson)!

P. 421.—U. TRUNCATULUS. F. Portrush (A. Bell)!; Bohuslän (Thudén); N.W. Germany (Philippi, as *Bulla retusa*); Rhodes (Hörnes). E. Madeira (Watson)!

P. 423.—U. OBTUSUS. F. Christiania (Crosskey and Robertson)! E. Dalmatia (Brusina)! Var. *Lajonkaireana*. F. N.W. Germany (Philippi). Var. *semistriata*. Smaller, with fine and close-set longitudinal striæ on the upper part of the body-whorl; spire slightly produced. Roach River, Essex.

P. 425.—U. VENTROSUS. *Bullæa ventrosa*, S. Wood, is a species of *Philine*.

P. 426.—U. EXPANSUS. St. Magnus Bay. E. Loffoden I., 300 f. (Sars); Finmark (Lilljeborg)!

P. 427.—U. HYALINUS. E. Naples (Tiberi, *f.* Weinkauff).

P. 429.—Add UTRICULUS GLOBO'SUS*, Lovén. (*Amphisphyra globosa*, Lov. Ind. Moll. Scand. p. 11.)

SHELL globosely oval, transparent, very thin, glossy, and iridescent: *sculpture*, slight, indistinct, and irregular spiral lines, which are only discernible with the aid of a magnifying-power and in certain lights; the crown or apex is closely puckered lengthwise: *epidermis* filmy: *colour* clear white: *spire* contracted, deeply sunken, and truncated; *whorls* 3, tumid, the outer one enveloping the rest; the apical whorls are minute, and the central one mammillar: *suture* deep: *mouth* narrow above (from the bulging of the periphery), wide and expanded below; base semicircular: *outer lip* flexuous and somewhat bent inwards; the upper part projects considerably, and is higher than the spire; outer corner rounded: *inner lip* forming a thin broad whitish film on the periphery: it is slightly folded over the pillar, behind which is a narrow umbilical groove: *pillar* sharp and flexuous: *fold* obscure. L. 0·15. B. 0·125.

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* Globose.

Habitat: St. Magnus Bay, 60–80 f., on a muddy bottom, very rare. E. Bohuslän to Finmark (Lovén); Loffoden I., 300 f. (Sars, as *Utriculopsis vitrea*)!; S. Sweden (Malm). Differs from *U. ventrosus* in the shape, spire, mouth, and sculpture.

P. 433.—Actæon tornatilis. F. Bohuslän (Thudén).

P. 437.—Bulla hydatis. Spawn of a pale orangecolour, and consisting of extremely numerous and minute ova enveloped in a wafer-like substance, which is covered on the upperside by a very thin membrane.

P. 439.—*B. elegans.* E. Morbihan (Taslé)!

P. 440.—B. utriculus. N. of Hebr., 189 f. (C. and T.). F. N.W. Germany (Philippi); Rhodes (Hörnes).

P. 441.—*B. striata.* E. Morbihan (Taslé)!

P. 443.—Scaphander lignarius. N. of Hebr., 530 f. (C. and T.). A remarkable monstrosity or variety lately occurred in my Shetland dredgings. It is very short, and the lower part of the shell is unusually expanded and gibbous.

P. 446.—S. librarius. N. of Hebr., 189 f. (C. and T.). E. Loffoden I., 300 f. (Sars).

P. 446.—Φιλίνη was the mother of the poet Theocritus.

P. 447.—Philine scabra. F. Pisa (Manzoni); Monte Mario (Rigacci)! E. Loffoden I., 300 f. (Sars)!; Quiberon in Brittany (Taslé); Arcachon (Lafont)!; G. Naples (Tiberi and others)!; Dalmatia (Brusina)!

P. 449.—P. catena. E. Arcachon (Lafont)!; Dalmatia (Brusina, as *P. punctata*)!

P. 452.—P. quadrata. N. of Hebr., 189 f. (C. and T.). E. Loffoden I., 300 f. (Sars); Danish coast (Mörch)! Burrows and conceals itself in the soft muddy sand which it inhabits. Its food consists chiefly of Foraminifera.

P. 453.—P. punctata. E. G. Naples (Stefanis)!

P. 454.—P. pruinosa. E. Loffoden I., 300 f. (Sars, as *P. granulosa*)! Dalmatia (Brusina)!

P. 456.—P. nitida. St. Magnus Bay, 60–80 f.

P. 462.—Table of distribution, as in preceding volumes.

N.B. Every naturalist is aware that the note of admiration (!) affixed to a locality or name is a certificate of verification.

TABLE of distribution. (See Vols. I.–IV.)

Species.	Northern.	Southern.	Upper Tertiary.	Extra-European localities.
Gastropoda (*continued* from vol. iv. p. 466).				
Aplysia punctata	—	—		Canaries.
depilans	—	—		
Pleurobranchus membranaceus	—	—		
plumula	—	—		
Runcina Hancocki				
Pleurophyllidia Loveni	—			
Limapontia nigra	—			
depressa				
Acteonia corrugata				
Cocksii				
Elysia viridis	—	—		
Alderia modesta	—			
Hermæa bifida	—			
dendritica	—			
Fiona nobilis	—			
Embletonia pulchra				
minuta				
pallida	—			
Grayi				
Eolis papillosa	—			
glauca				
Alderi				
coronata	—			
Drummondi	—			
punctata				
elegans				
rufibranchialis	—			
lineata	—	—		
gracilis				
smaragdina	—			
pellucida				
Landsburgi	—			
alba	—			
carnea				
glaucoïdes				
Peachii				
nana	—			
stipata				
angulata	—			
inornata	?—			

Species.	Northern.	Southern.	Upper Tertiary.	Extra-European localities.
Gastropoda (*continued*).				
Eolis concinna	—			
olivacea				
aurantiaca	—			
pustulata				
Couchii				
amœna				
Northumbrica				
arenicola				
Glottensis				
cærulea				
viridis				
purpurascens				
cingulata	—			
vittata				
picta				
tricolor	—			
Farrani	—			
Adelaïdæ				
exigua	—			
despecta				
Proctonotus mucroniferus				
Antiopa cristata		—		
hyalina				
Doto fragilis				
pinnatifida				
coronata	—	—		
cuspidata				
Dendronotus arborescens	—			
Hero formosa	—			
Lomanotus marmoratus				
flavidus				
Portlandicus				
Scyllæa pelagica	—	—		
Tritonia Hombergi	—	—		
alba				
plebeia	—	—		
lineata				
Ægirus punctilucens	—			
Triopa claviger	—			
Thecacera pennigera	—			
virescens				
capitata				
Crimora papillata				
Polycera quadrilineata	—	—		
ocellata	—	—		
Lessoni	—	—		

Species.	Northern.	Southern.	Upper Tertiary.	Extra-European localities.
Gastropoda (*continued*).				
Ancula cristata	—			
Idalia elegans		—		
Leachii				
aspersa	—			
inæqualis				
pulchella	—			
quadricornis				
Goniodoris nodosa	—			
castanea				
Doris tuberculata	—	?—		
flammea				
Zetlandica				
millegrana				
testudinaria		—		
Johnstoni	—			
coccinea	—	—		
repanda	—			
aspera	—			
proxima	—			
muricata	—			
Lovéni	—			
Ulidiana				
diaphana				
oblonga				
bilamellata	—			
depressa	—	—		
inconspicua		—		
pusilla				
sparsa	—			
pilosa	—	—		
quadrangulata				
Oncidium Celticum	—	?—		
Assiminea Grayana				
littorina		—		Madeira and Teneriffe.
Melampus bidentatus	—	—		Madeira.
myosotis	—	—	—	Madeira, Jamaica, and United States.
Otina otis	—			
Pteropoda.				
Spirialis retroversus	—	—	—	Canaries and United States.
Clio pyramidata	—	—	—	Atlantic Ocean.
Cephalopoda.				
Ommatostrephes todarus	—	—		

Species.	Northern.	Southern.	Upper Tertiary.	Extra-European localities.
Cephalopoda (*continued*).				
Ommatostrephes sagittatus	—	—		
Loligo vulgaris	—	—		
media	—	—		
Rossia macrosoma	—	—		
papillifera				
Sepiola Rondeleti	—	—		Greenland.
Sepia officinalis	—	—		
elegans	—	—		Algiers.
biserialis		—		
Octopus vulgaris	—	—		Canaries; ? Red Sea, West Indies, South Atlantic, and Indian Ocean.
Eledone cirrosa	—			
SUPPLEMENTAL.				
Arion flavus	—			
Limax lævis	—	—		
tenellus	—	—		
Pecten aratus	—	—		
vitreus	—	—	—	
Leda lucida	—		—	
Limopsis borealis	—			
Arca nodulosa	—	—	—	
Montacuta tumidula	—			
Dawsoni				
donacina			—	
Kellia cycladia		—	—	
Siphonodentalium Lofotense	—	—		
Cadulus subfusiformis	—	—	—	
Dentalium abyssorum	—		—	N.E. America.
Trochus glaucus	—		—	Greenland.
Lacuna tenella				
Odostomia Warreni		—		
Natica affinis	—		—	Greenland.
Pleurotoma carinata	—		—	
Utriculus globosus	—			
Scaphander librarius	—			
Total 159	90	44	13	

As in the last volume, I will distinguish the species enumerated in the foregoing Table. Northern and southern 36, peculiarly northern 53, peculiarly southern 8, hitherto unnoticed beyond our isles and seas 61, fossil (northern 5, southern 1, common to both divisions 6, not yet found elsewhere as recent 1) 13.

The total number of British Mollusca described in this work is 686, viz. 124 Land and Freshwater (Conchifera 15, Gastropoda 109), and 562 Marine (Brachiopoda 6, Conchifera 171, Solenoconchia 5, Gastropoda 366, Pteropoda 2, and Cephalopoda 12); a few more are doubtful.

The subject, however, is far from being exhausted, in many points of view; and when our knowledge of it has become more extended, we must continually say with Seneca, "Multum egerunt, qui ante nos fuerunt, sed non peregerunt. Multum adhuc restat operis, multumque restabit; nec ulli, nato post mille sæcula, præcluditur occasio aliquid adhuc adjiciendi."

> "Enough, if something from our hands have power
> To live, and act, and serve the future hour."

HINTS FOR COLLECTING.

Land Mollusca are found in woods, hedges, gardens, and meadows, on rocks (especially those which are calcareous), old walls, dry grassy plains, and trunks of trees, at the roots of grass, among fallen leaves, moss, and herbage of every kind, by the sides of lakes and ponds, and under logs of wood and stones. Rainy or moist weather in the summer and autumn is the best time for finding them. *Testacella* and *Achatina* are subterraneous; the former can be discovered by digging in suitable places (see Vol. I. p. 144), and the latter in old graveyards and ploughed fields. Species of *Vertigo* (e.g. *V. antivertigo* and *V. Moulinsiana*) may be caught by laying traps consisting of pieces of decayed wood and of stones with an uneven base, at the edges of ponds which they frequent. Charpentier, when hunting for *Clausiliæ* in the Tyrol, used to take a boy with him for the purpose of moistening with water from a large syringe or squirt the crevices of rocks in which the *Clausiliæ* had ensconced themselves during the daytime; they soon emerged from their retreat, and were transferred to my friend's collecting-boxes. Some species may be taken by sweeping the long grass in woods and shady places with a butterfly-net; and a bagful of decaying leaves, when dried and shaken in a corn-sieve, will yield many of the small *Helicidæ* and occasionally *Acme lineata*. Mr. Ashford obtained several of the rare species of *Vertigo* by sifting and examining the broken twigs, dead leaves, and vegetable mould which accumulate in the fissures of limestone rocks. The rejectamenta of rivers and streams often contain a quantity of dead shells, both land and freshwater, which have been washed away by the rain and carried down by floods. Bogs and pine-forests are more or less unproductive, being apparently distasteful to the snail tribe. The larger freshwater shells, or *Unionidæ*, may be procured by a landing-net fixed to a long pole; the pearl-mussel (*U. margaritifer*), which inhabits shallow rivers and streams, is taken by wading or with a stick cloven at the end. The most useful contrivance for collecting the smaller kinds is a hand-sieve fixed to a short pole or walking-stick, having a ledge or rim about two inches deep and the bottom of fine copper or brass wirework. Aquatic plants can thus be searched, and the mud strained in the water, so as to reap a harvest of *Limnæidæ* and *Sphæriidæ*.

Ancylus fluviatilis adheres to rocks and stones in running water. The larval cases of *Phryganeæ*, or "caddis-worms," are now and then studded with *Valvatæ, Planorbes,* and *Pisidia.*

Marine shells have an equally varied habitat, and are far more numerous in species. Many live between tide-marks, under loose stones, on seaweeds, or burrowing in sand. The laminarian zone, or the lower part of the littoral zone—whichever it may be called—affords nourishment and shelter to other kinds, particularly *Rissoæ.* These may be got by washing a quantity of the smaller and finer seaweeds in a tub of *fresh* water; they are thus killed and fall to the bottom. The "spolia marina" and drifted shell-sand which are thrown up on sandy shores, especially during and after storms, and which fringe the line of high water, the refuse from trawling-vessels, and the stomachs of fishes and starfishes should be examined; and the deep-sea fishermen may be induced to bring home rare whelks caught on their lines, which sometimes fetch much more than a ling or codfish.

Oceanic or floating mollusks are procured with a towing-net. This may be a bag of flag-bunting, sewn round a wooden or wire hoop about a foot in diameter, and secured to a strong line by three pieces of whip-cord, each from 15 to 18 inches long, which are fastened to the hoop at equal distances, with the ends tied together. At the bottom of the bag there should be a small oval bottle to keep it steady and receive some of the animals. The net is towed astern, clear of the ship's wake, or held in the hand. The length of the line will depend on the speed of the vessel at the time, and on the amount of strain caused by the partly submerged net.

But the dredge

> "With its iron edge,
> And its mystical triangle,
> And its hided net with meshes set,
> Odd fishes to entangle!",

surpasses all other methods of investigating the fauna of the ocean. Its history, as an instrument of scientific research, dates from the publication of O. F. Müller's great posthumous work, the 'Zoologia Danica,' in 1788. The oyster-dredge is much more ancient, and is familiar to every one. The principal difference between this and the zoologist's dredge consists in the latter having a blade or scraper on each side (so that it always falls to the bottom in the right position), and it has also a closely netted bag within the hide or outer net; iron ringwork does very well to contain oysters, but not the small miscellaneous treasures of the zoologist. The weight of the dredge varies from 14 lbs. to ¾ cwt., according to the depth of water in which it is worked. In bays and sheltered parts of the sea, where the depth does not exceed 20 or 30 fathoms, a small sailing-boat, or one with oars, from 50 to 100 fathoms of line, and two or three men will answer the purpose; for deeper water a larger vessel and a proportionate supply of rope, with a more numerous crew, are necessary. In the latter case, if a sailing vessel be employed, she is made to lie to (the helm being put up), with shortened sail and her head close to the wind. Do not attempt to dredge against the tide: you may dredge with or across it. When the ground is rough, the dredge is likely to catch in a stone, and may be easily lost. To prevent such an accident, the end of the rope is fastened, not to the ring which holds the arms together and forms the point of the triangle, but to one side of the dredge; and the ring is attached to the rope by a "stop" or bit of spunyarn, which is slack enough to break in case the dredge catches: the stop is then snapped asunder, and the dredge, hanging on one side, is set free and hauled up. In order to give timely warning of the dredge being caught, and to ascertain the degree of tension to which the rope is subjected, the upper part of the rope is attached to the bulwarks by india-rubber springs called "accumulators." When the dredge has been working from half an hour to two hours (the time being regulated by the depth and nature of the ground), the rope is passed through a moveable block fixed to the shrouds, and hauled in by means of a double winch or drum; in a boat this is done by hand. The contents of the dredge should be emptied gently and carefully on a piece of tarpaulin. The sieves then come into requisition; and these are indispensable for examining the results. They are usually made of copper wire, and should be of four or five different sizes, fitting one into another or "nested," the coarsest sieve being uppermost. The most convenient sizes of the meshes are $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, and $\frac{1}{32}$ inch. The frame should be of oak or some other wood which will not swell in water. Each of the lower sieves should have a ledge on the inside about an inch from the bottom, to receive the one above it, the finer stuff which passes into it being thus protected from pressure. The diameter of the top sieve may be 10 or 12 inches, and the outer rim 3 or 4 inches deep. The top and bottom sieves should be strengthened by cross bars of copper. The stuff should be sifted in a tub of seawater; and after it has been looked over, so as to secure any living specimens for more careful examination or dissection, the residue may be put into bags, dried on cloths in the open air, and afterwards resifted.

Such dried produce often yields an abundant gleaning to an industrious picker. A plain black japanned tray, a few small shallow cardboard or wooden trays lined with the finest black cloth, a delicate plier or forceps made of horn or some soft metal, a set of sable or camel-hair brushes, and lenses or magnifying-glasses of different powers (a microscope is not wanted) will be the apparatus most useful to the naturalist for his "triage." Live shells may be killed by plunging them into boiling or scalding water. In the case of univalves the animals can be removed with a crooked wire or fine crochet-needle, the operculum (if there is any) being preserved with the shell; in the case of bivalves, the animal is easily extracted with a penknife or scalpel; and, while the shells are wet, the valves of most specimens should be tied together with thread, one or two being left open to show the hinge and inside. All marine shells must be soaked for some hours in fresh water; otherwise the chemical action of sea-salt on the carbonate of lime, of which they are composed, will erode the surface; and care must be taken not to rub off the epidermis by using too hard a brush in cleaning them. The arrangement of shells in a collection must depend on the fancy of the conchologist. I use mahogany tablets, ¼ inch thick, of various sizes, covered with paper of a neutral tint, and a patch of black for minute shells; and I fasten the specimens with gum (⅔ tragacanth and ⅓ arabic) slowly dissolved in an equal bulk of water, to which a few drops of spirit of wine are added from time to time as a preservative against mould. Instead of wooden tablets, glass slides of half the thickness may be used; and in the case of a single specimen of a univalve shell, both sides can be examined by leaving a hole in the paper and fastening the specimen to the glass.

ALPHABETICAL LIST

OF

THE PRINCIPAL WORKS

REFERRED TO IN THIS AND THE PRECEDING THREE VOLUMES, BESIDES THOSE MENTIONED IN THE FIRST VOLUME. MOST OF THE OLDER WORKS ARE OMITTED. IN THE PREPARATION OF THE SUPPLEMENT I HAVE ALSO CONSULTED A GREAT NUMBER OF ADDITIONAL TREATISES ON LAND AND FRESHWATER SHELLS.

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ERRATA.

Page 102, line 4 from bottom, for "Müller" read "Möller".
,, 160, line 19 from top, for "EMARGINATA" read "MARGINATA".
,, 177, line 16 from bottom, for "*spantangi*" read "*spatangi*".
,, 190, line 9 from top, for "CARATISOLEN" read "CERATISOLEN".
,, 216, lines 10 and 11 from top, omit "*Delphinula pusilla*, Calcara."

EXPLANATION OF PLATES.

FRONTISPIECE.

Octopus vulgaris.

PLATE I.

Fig. 1. *Aplysia punctata.*
2. *Pleurobranchus plumula.*
3. *Runcina Hancocki.*
Fig. 4. *Pleurophyllidia Loveni.*
5. *Limapontia nigra.*
6. *Elysia viridis.*

PLATE II.

Fig. 1. *Hermæa bifida.*
2. *Fiona nobilis.*
3. *Eolis papillosa.*
4. *Antiopa cristata.*
Fig. 5. *Doto fragilis.*
6. *Dendronotus arborescens.*

PLATE III.

Fig. 1. *Scyllæa pelagica.*
2. *Tritonia Hombergi.*
3. *Ancula cristata.*
Fig. 4. *Doris tuberculata.*
5. *Oncidium Celticum.*

PLATE IV.

Fig. 1. *Assiminea Grayana.*
2. *Melampus myosotis.*
3. *Otina otis.*
Fig. 4. *Spirialis retroversus.*
5. *Clio pyramidata.*

PLATE V.

Fig. 1. *Ommatostrephes sagittatus.*
Fig. 2. *Loligo vulgaris.*

PLATE VI.

Fig. 1. *Rossia macrosoma.*
2. *Sepiola Rondeleti.*
Fig. 3. *Sepia officinalis*

PLATE VII.

Fig. 1. *Octopus vulgaris.*
Fig. 2. *Eledone cirrosa.*

PLATE VIII.

(Supplemental.)

Fig. 1. *Terebratella Spitzbergensis.*
1^{a}. *T. Chilensis*; to show the skeleton.
2. *Rhynchonella psittacea.*
3. *Woodia digitaria.*
Fig 4. *Cypricardia lithophagella.*
5. *Siphonodentalium Lofotense.*
6. *Cadulus subfusiformis.*

THE END.

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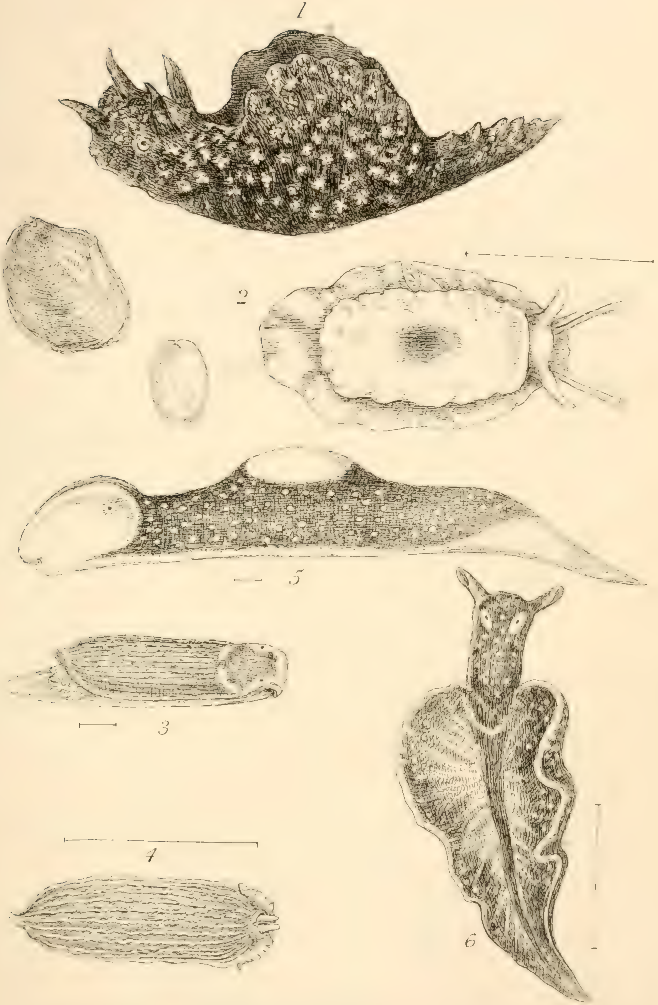
Plate I.



1. *Aplysia*. 2. *Pleurobranchus*. 3. *Runcina*.
4. *Pleurophyllidia*. 5. *Limapontia*. 6. *Elysia*.

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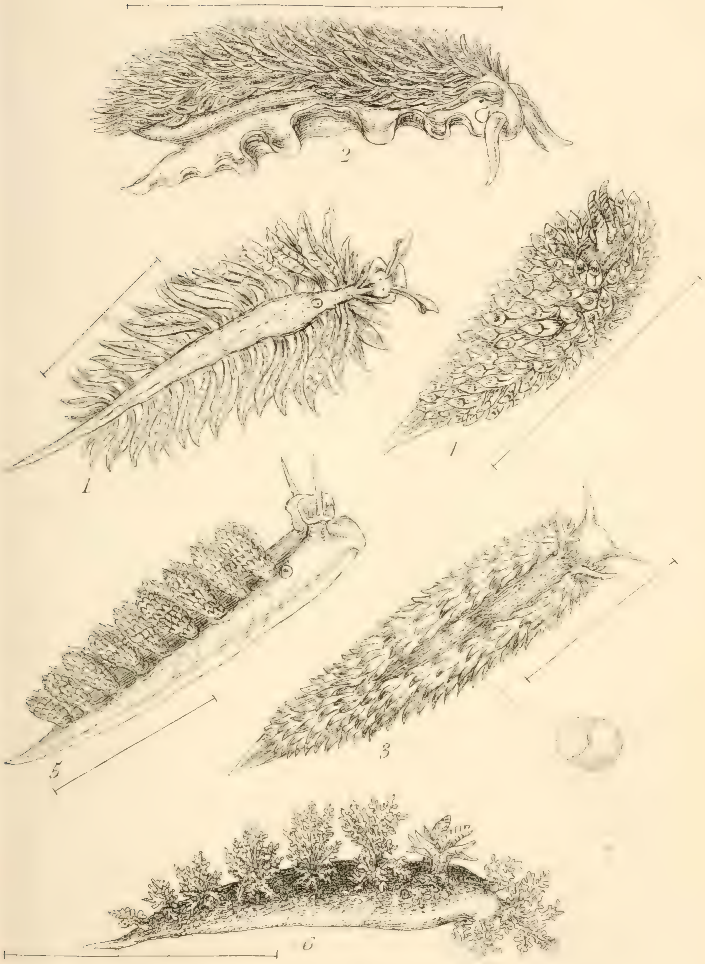
Plate 11. Vol. V.



1. Hermæa. 2. Fiona. 3. Eolis.
4. Antiopa. 5. Doto. 6. Dendronotus.

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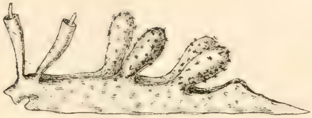
Plate III. Vol. V.



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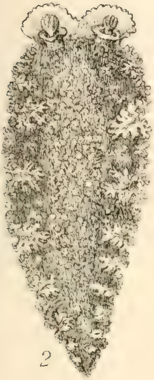

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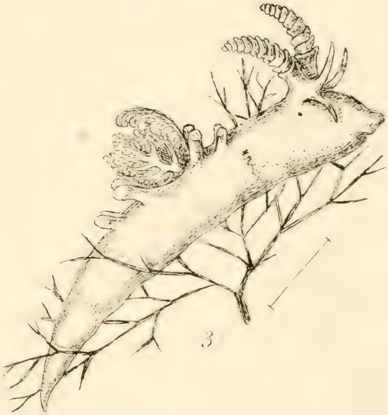

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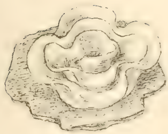

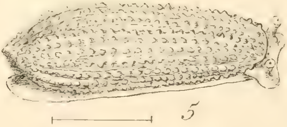

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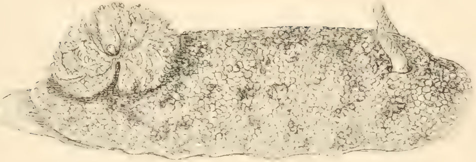

4

. *Scyllæa*. 2. *Tritonia*. 3. *Ancula*. 4. *Doris*. 5. *Oncidium*.

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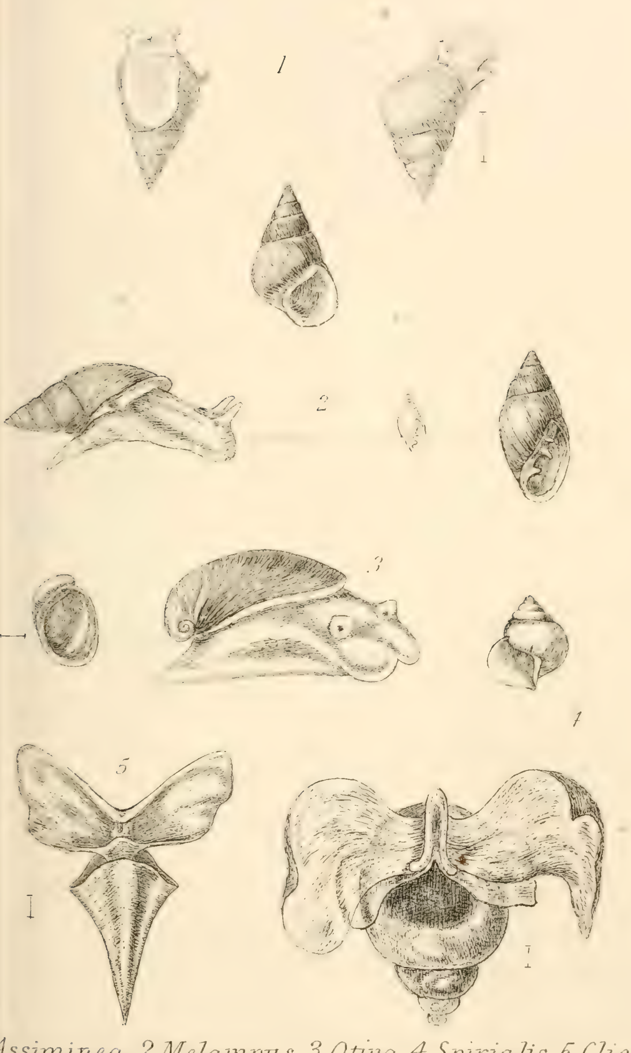
Plate IV.



Assiminea . 2 Melampus . 3. Otina . 4. Spirialis . 5. Clio .

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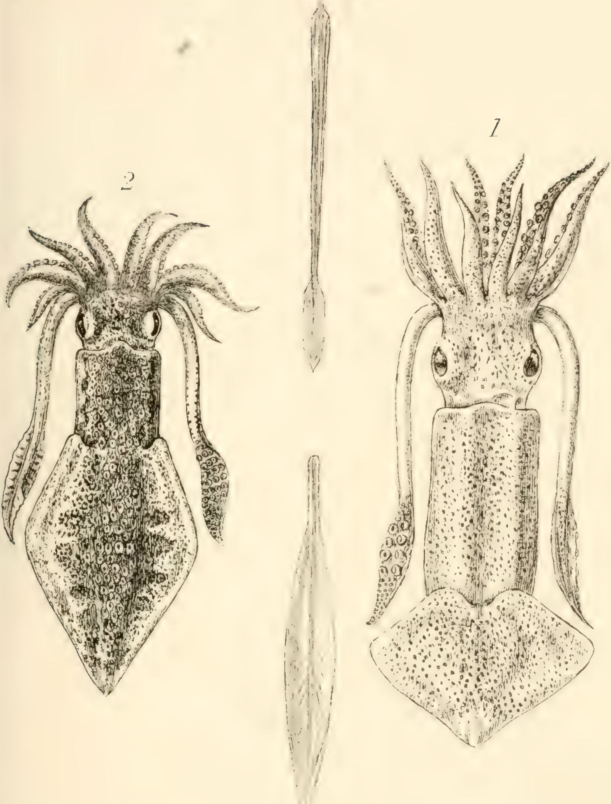
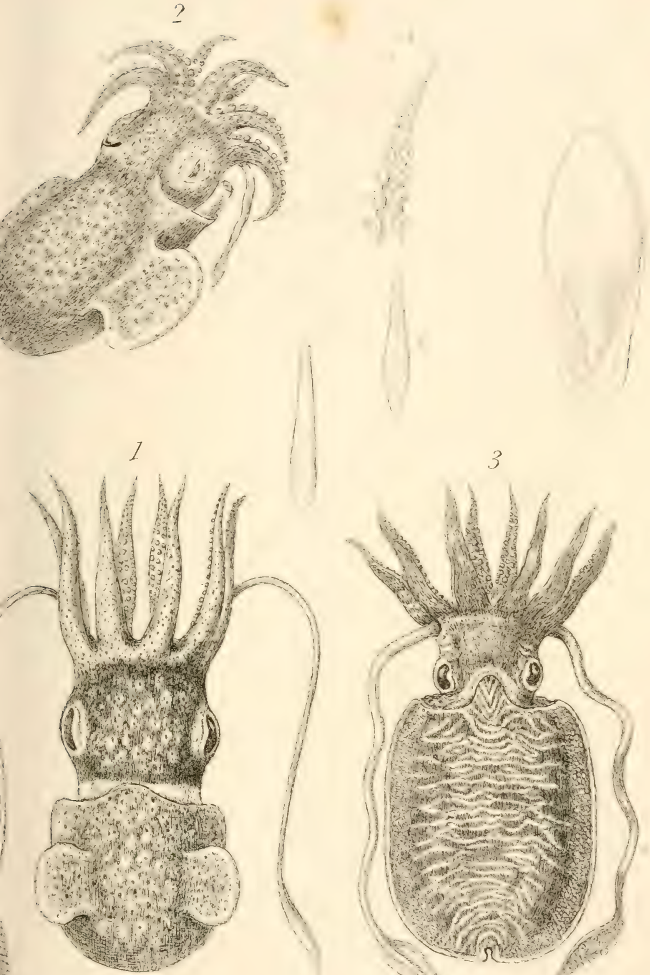
Plate V.



1. *Ommatostrephes*. 2. *Loligo*.

Pub. by Van Voorst.

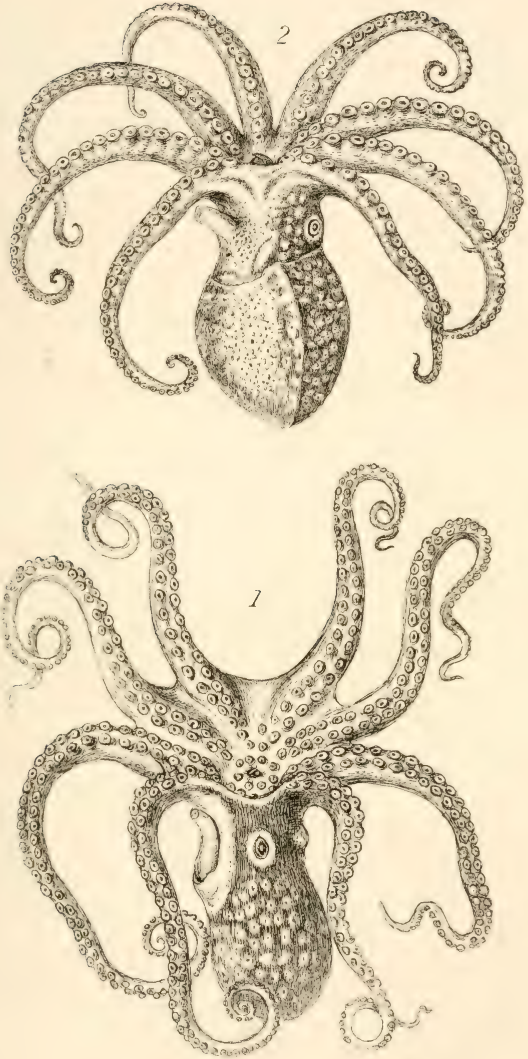


1. *Rossia*. 2. *Sepiola*. 3. *Sepia*.

[illegible]

Pub. by Van Voorst.

Plate VII.

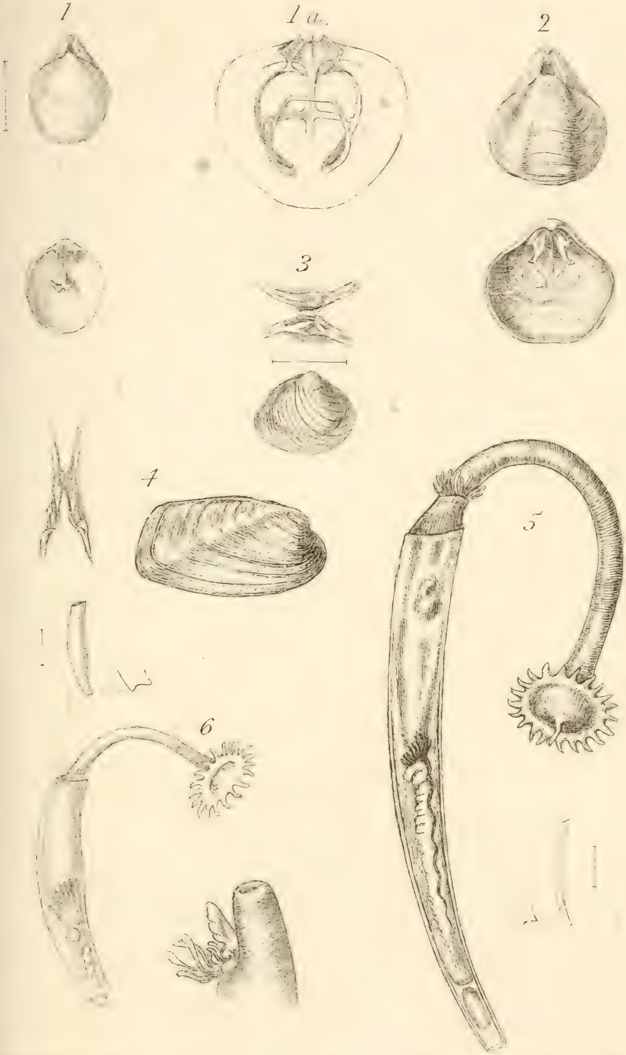


1. Octopus. 2. Eledone.

G. B. Sowerby.

Pub. by Van Voorst

Plate VIII. Vol. V.

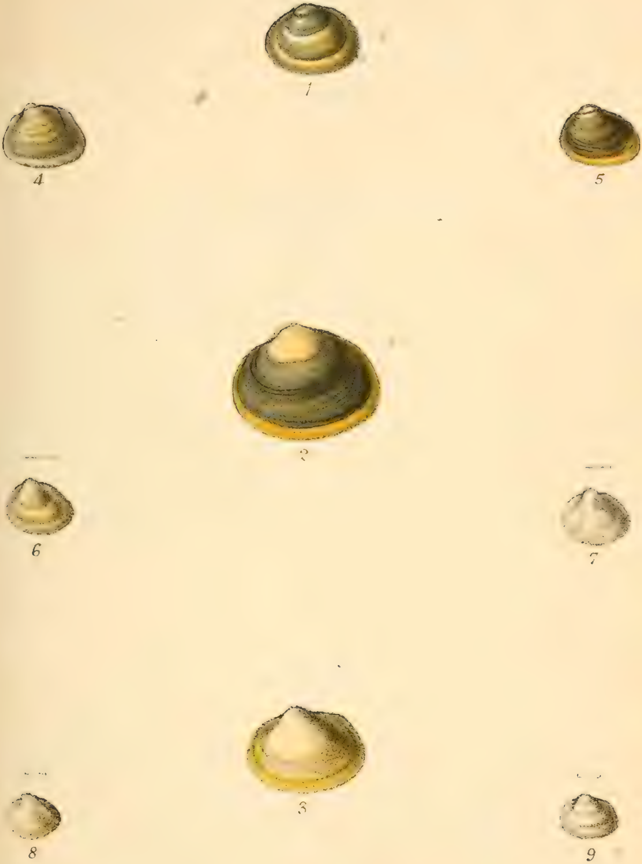


1. Terebratella. 1a. from Davidson. 2 Rhynchonella. 3. Woodia.
4. Cypricardia. 5. Siphonodentalium. 6. Cadulus.

G.B. Sowerby.

Pub. by Van Voorst.

Pl. I.

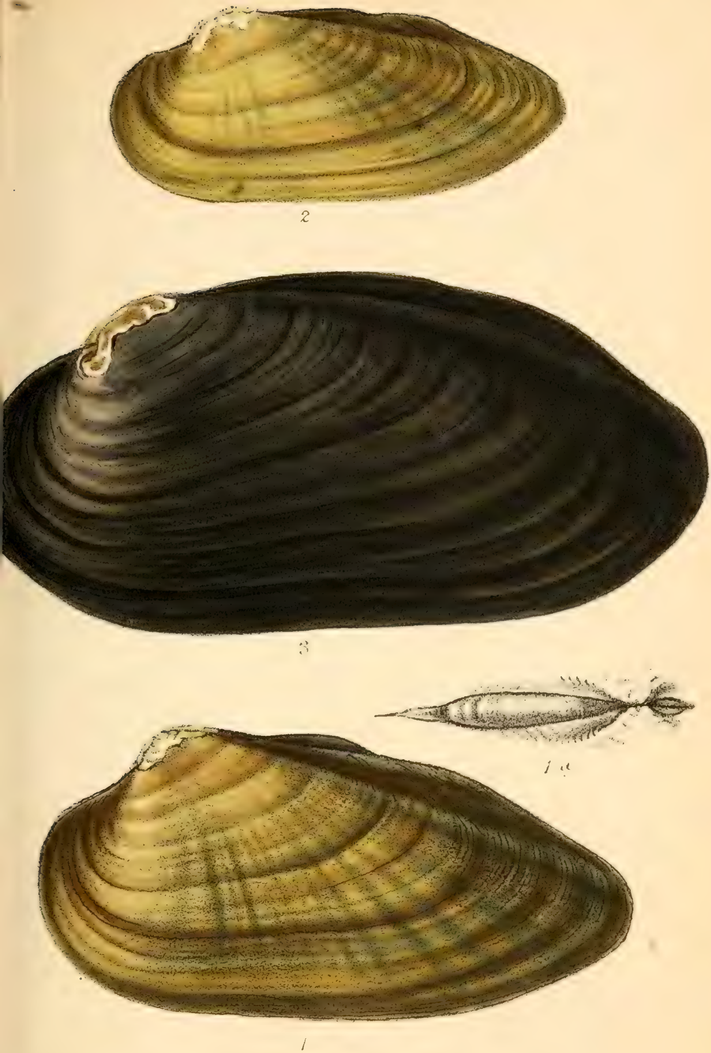


1. Sphærium corneum. 2. S. rivicola. 3. S. ovale. 4. S. lacustre. 5 Pisidium amnicum 6. P. fontinale 7. P. pusillum. 8. P. nitidum 9. P. roseum.

nv.

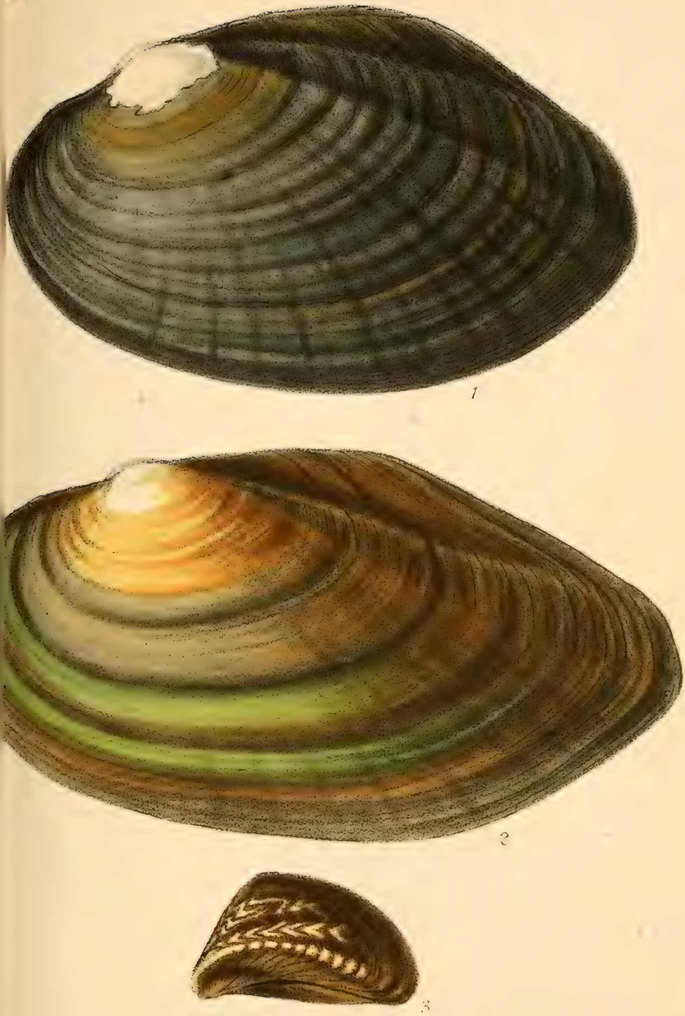
G. B. Sowerby

Pl. II



var 1 1a Unio tumidus. 2 U. pictorum. 3 U. margaritifer. G. B. Sowerb

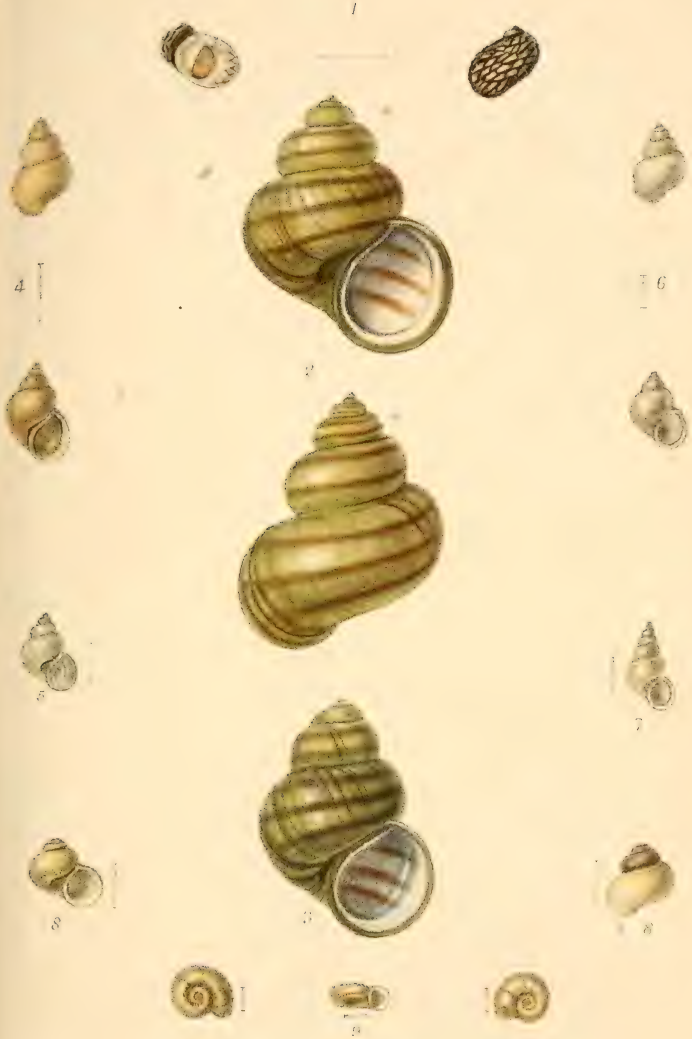
Pl. III



1. *Anodonta cygnea.* 2. *A. anatina.*
3. *Dreissena polymorpha*

G B. Sowerby.

Pl. I

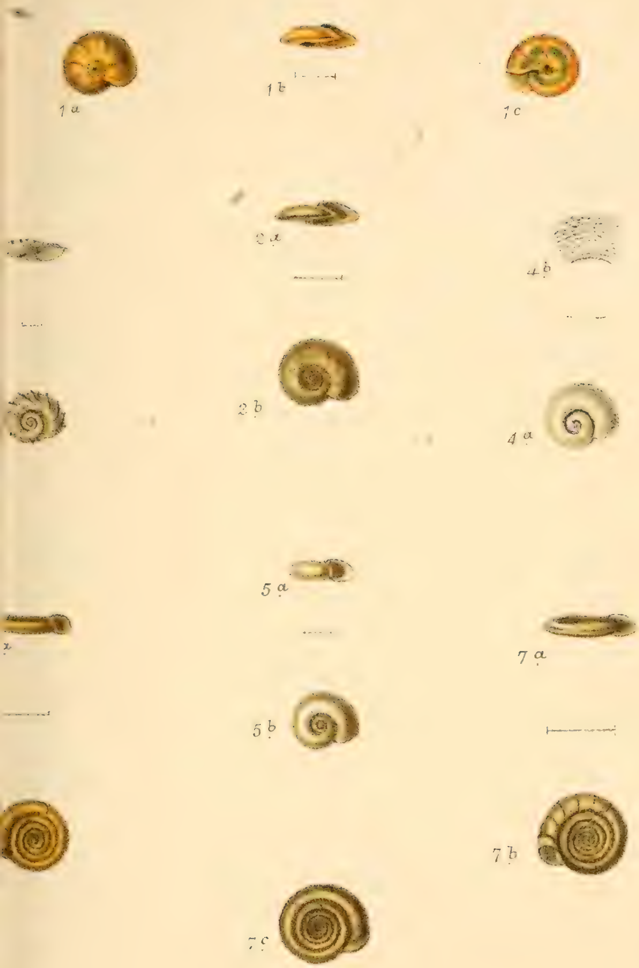


1 Neritina fluviatilis. 2. Paludina contecta. 3. P. vivipara
4. Bythinia tentaculata 5. B. Leachii 6. Hydrobia similis
7. H. ventrosa 8. Valvata piscinalis. 9. V. cristata.

mp.

G.B. Sowerby

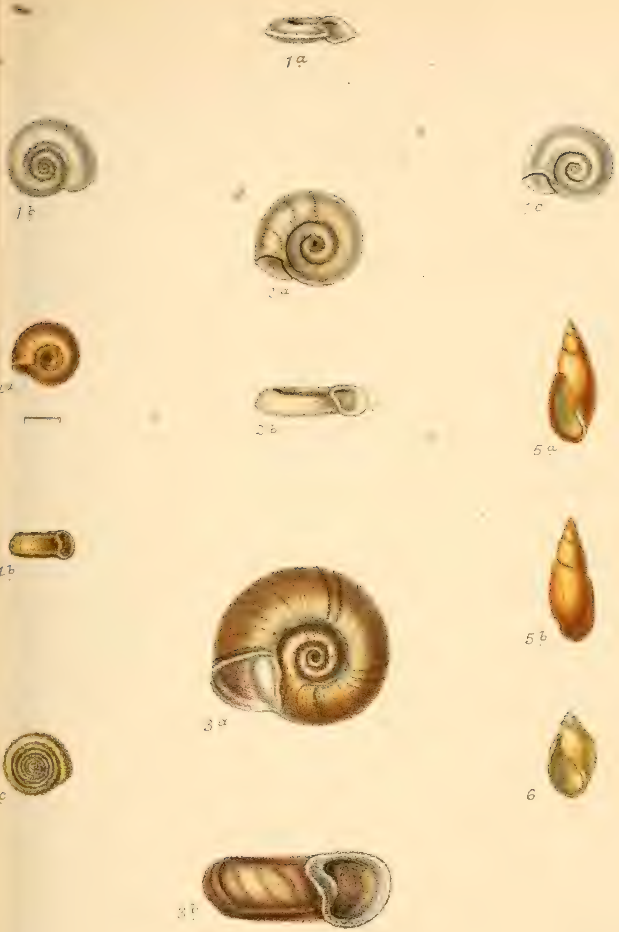
Pl. V.


1 a
1 b
1 c
2 a
4 b
2 b
4 a
5 a
7 a
5 b
7 b
7 c

1. *Planorbis lineatus.* 2. *P. nitidus.* 3. *P. nautileus.*
4. *P. albus.* 5. *P. glaber.* 6. *P. spirorbis.* 7. *P. vortex.*

G.B. Sowerby

Pl. VI.



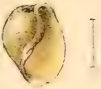
1 a
1 b
1 c
2 a
5 a
2 b
5 b
3 a
6
3 b

Planorbis carinatus. 2. P. complanatus. 3. P. corneus.
P. contortus. 5. Physa hypnorum. 6. P. fontinalis.—

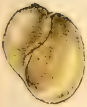
np.

G.B. Sowerby

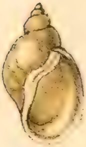
Pl. VII



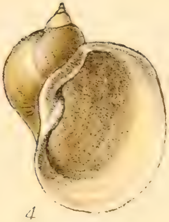
2



1



3



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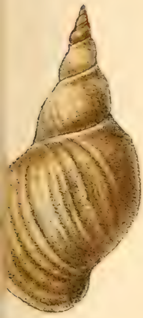
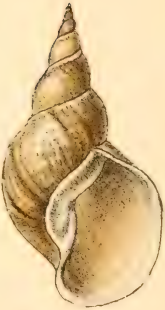
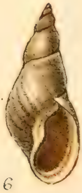


a



5 b



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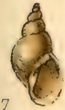
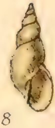


7

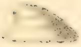


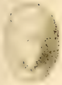
8

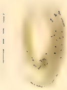
nœa glutinosa 2 L. involuta 3 L. peregra 4 L. auricularia
stagnalis. 6. L. palustris. 7. L. truncatula 8 L. glabra

D. G. B. Sowerby

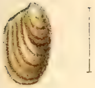
Pl. VIII

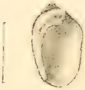

1 a

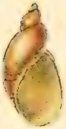

1 b


2 b

2 a


3 a


3 b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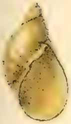
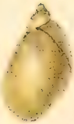
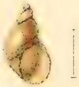

4 a


4 b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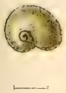
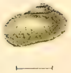
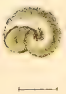
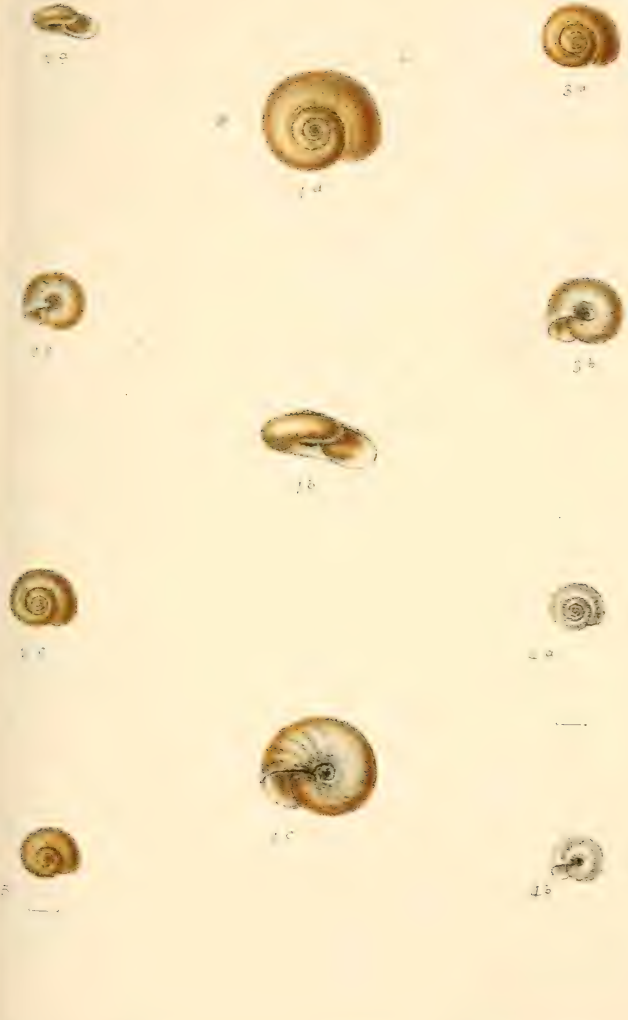

a


7 b


7 c

Ancylus fluviatilis 2 A. lacustris 3 Testacella Haliotidea
Succinea putris 5. S. elegans. 6. S oblonga. 7 Vitrina pellucida

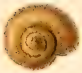
mp. G.B. Sowerby.

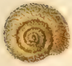

2 a
1 a
3 a
2 b
3 b
1 b
2 c
4 a
1 c
5
4 b

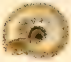
Zonites cellarius. 2. Z. alliarius. 3. Z. nitidulus.
4. Z. purus. 5. Z. radiatulus.

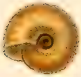
G. B. Sowerby

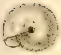
Pl. X

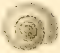

1 a

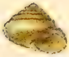

2 a

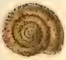

2 b

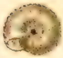

1 b

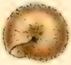

3 a

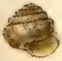

3 b

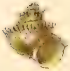

4 a


5 a


5 b

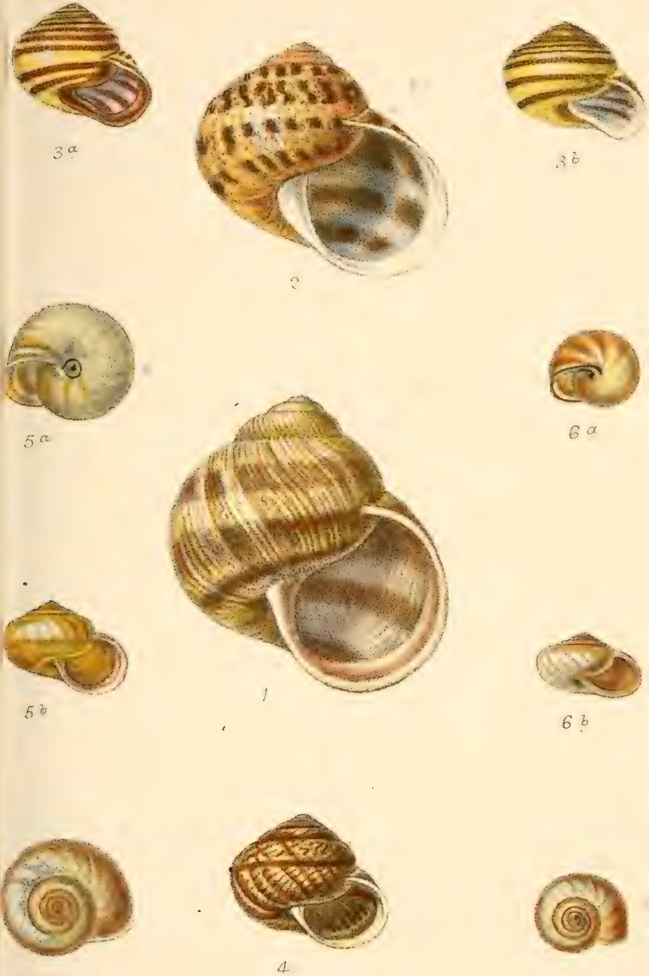

4 b


c


6

Zonites nitidus. 2. Z. excavatus. 3. Z. crystallinus
Z. fulvus. 5. Helix lamellata. 6. H. aculeata.

G. B Sowerby.

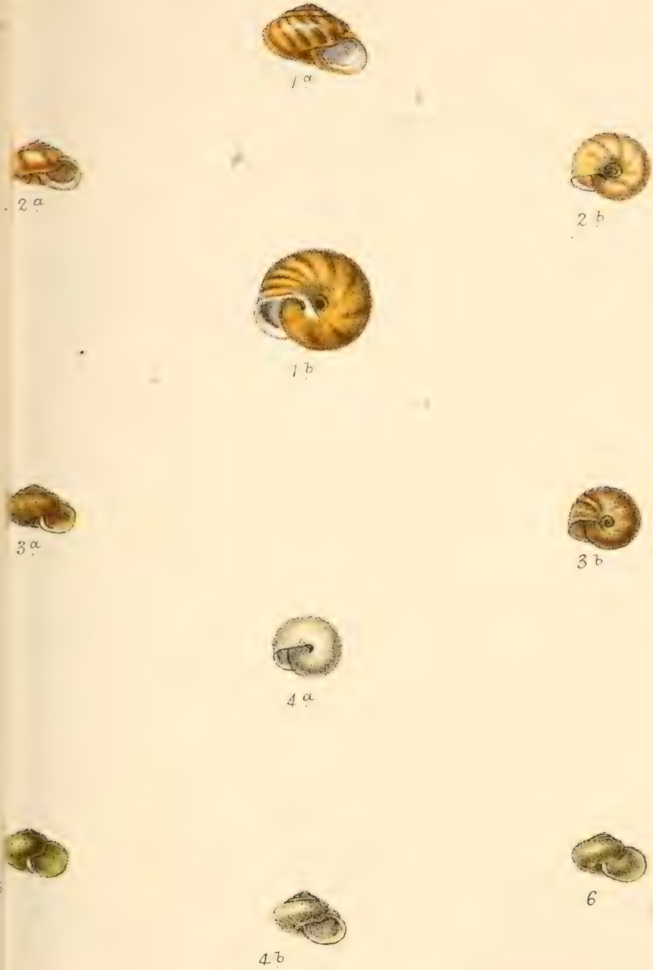

3a
2
3b
5a
6a
1
5b
6b
5c
4
6c

lix pomatia. 2 H. aspersa 3. H. nemoralis. 3^b var hortensis
4. H. arbustorum. 5. H. Cantiana. 6. H. Cartusiana.

p.

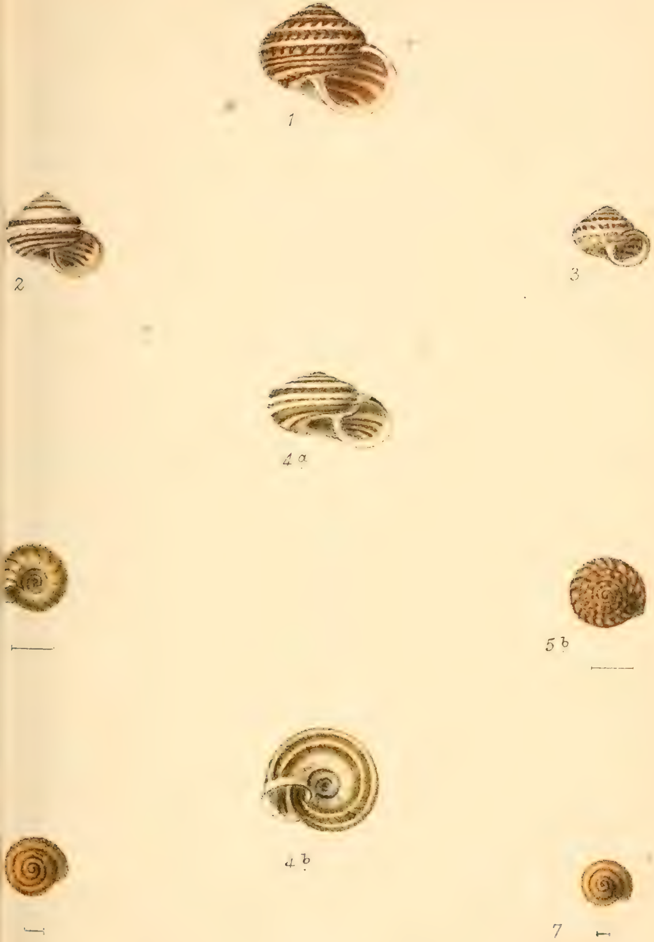
G.B Sowerby.

Pl. XII.


1a
2a
2b
1b
3a
3b
4a
5
6
4b

lelix rufescens. 2 H concinna. 3 H. hispida 4. H. sericea.
5. H. revelata 6. H. fusca.

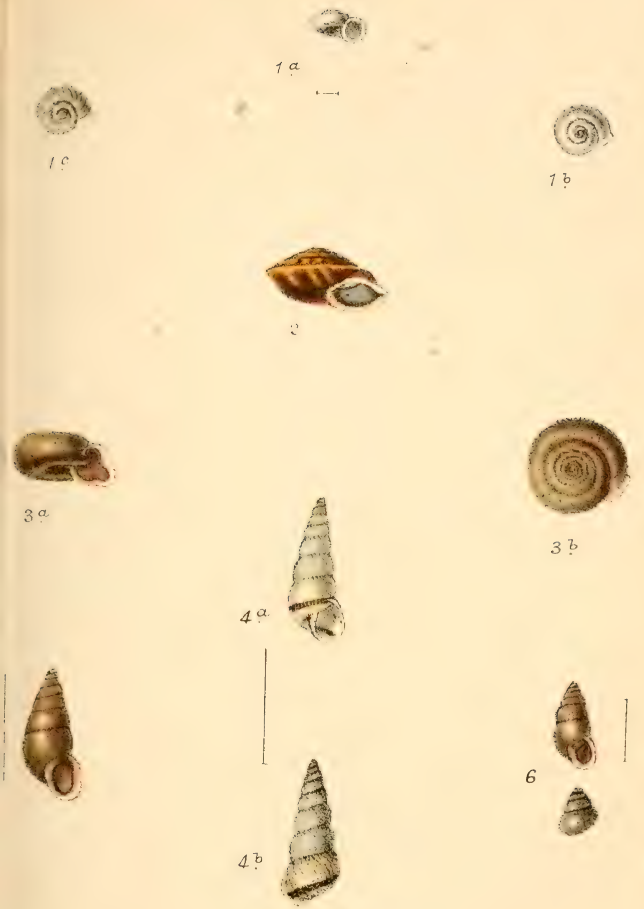
G.B. Sowerby


1
2
3
4 a
5 b
4 b
7

elix Pisana 2. H. virgata 3. H. caperata 4. H. ericetorum
5. H. rotundata 6. H. rupestris 7. H. pygmæa.

np. G.B Sowerb

Pl. XIV.

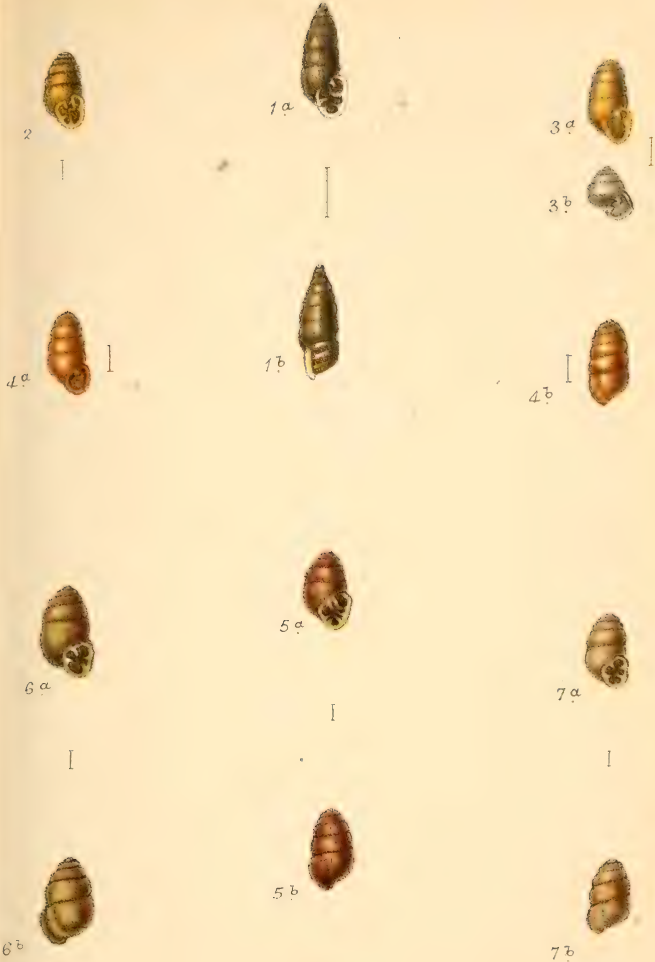

1a
1c
1b
2
3a
3b
4a
6
4b

elix pulchella. (1.c. var costata) 2. H lapicida 3 H obvoluta
4. Bulimus acutus. 5 B. montanus 6. B. obscurus.

mp.

G. B. Sowerb

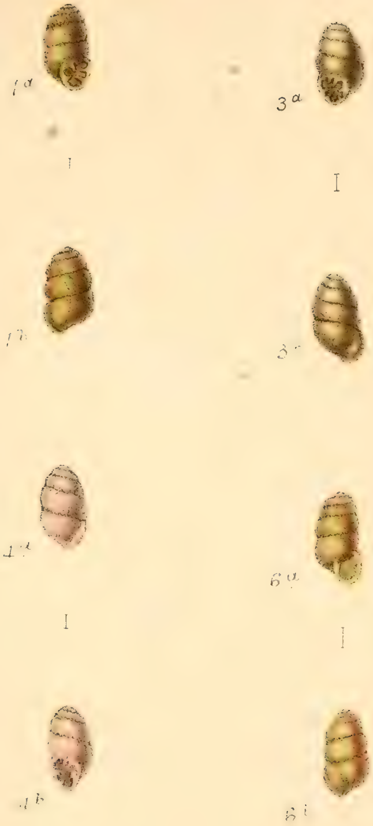
Pl. XV.



1 a
1 b
2
3 a
3 b
4 a
4 b
5 a
5 b
6 a
6 b
7 a
7 b

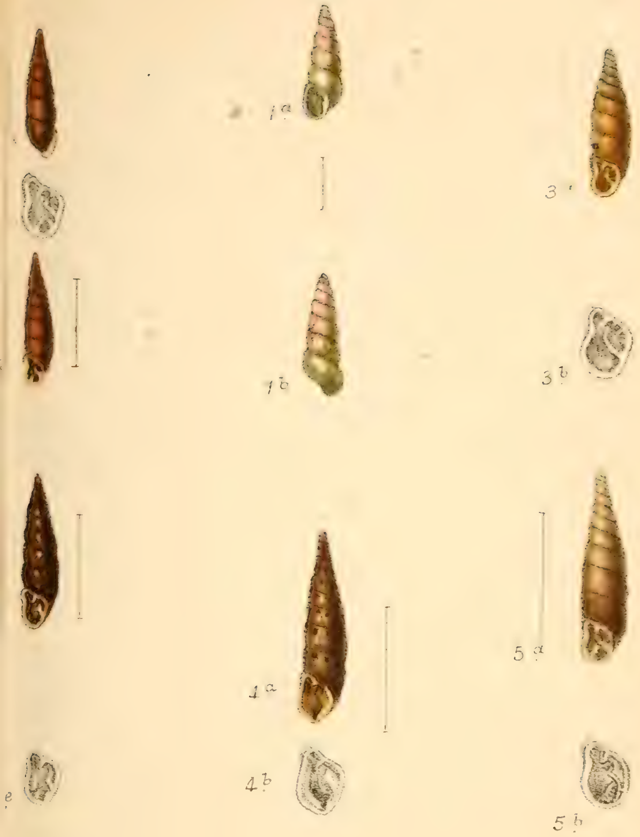
Pupa secale 2. P. ringens 3. P. umbilicata 4. P. marginata
5. Vertigo antivertigo. 6. V. Moulinsiana 7. V. pygmæa

G. B. Sowerby


1a
3a
1b
3b
4a
6a
4b
6b

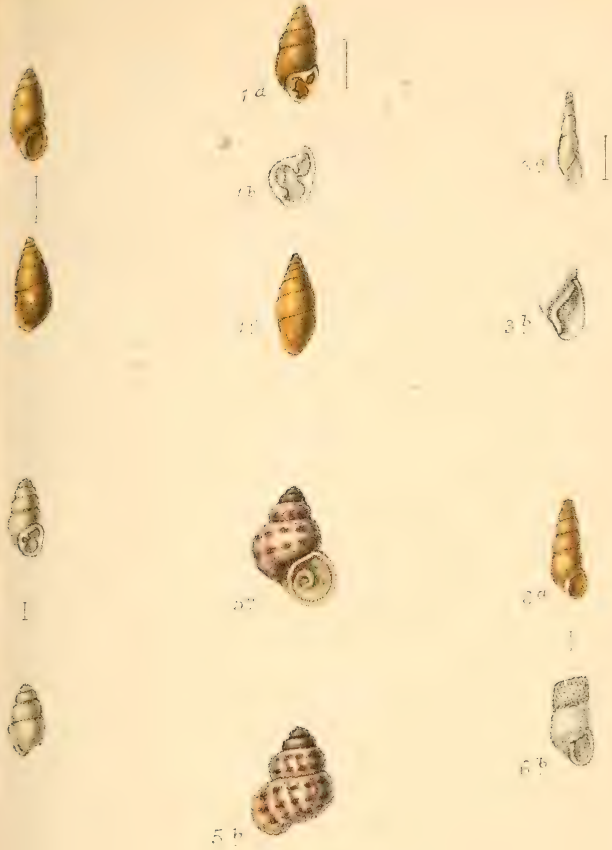
go alpestris. 2. V. substriata. 3 V. pusilla

ngustior. 5 V. minutissima. 6. V. edentula.


1^{a}
1^{b}
3
3^{b}
5^{a}
4^{a}
e
4^{b}
5^{b}

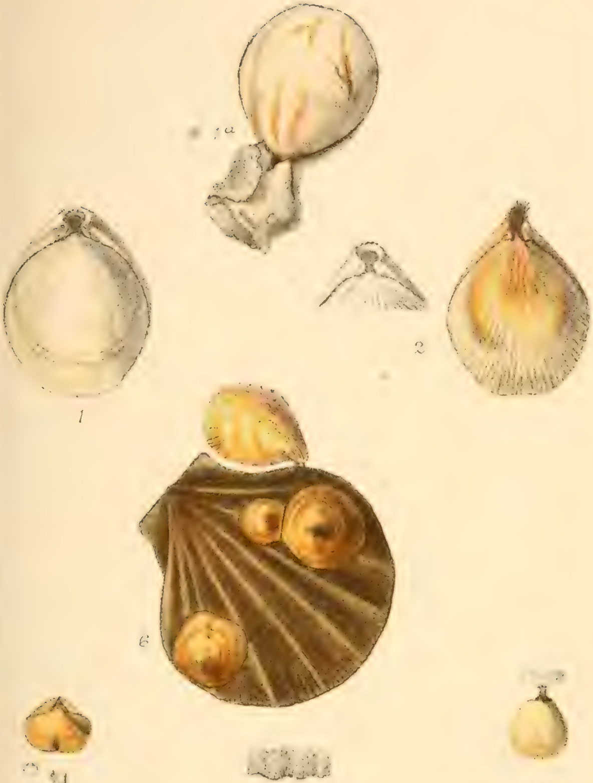
lia perversa. 2 Clausilia rugosa (2^{d}, 2^{e} var. dubia)
3. C. Rolphii. 4. C. biplicata. 5. C. laminata.

G. B. Sowerby


1 a
1 b
1 c
3 a
3 b
5 a
2 a
6 b
5 b

hlicopa tridens 2. C. lubrica. 3. Achatina acicula.
ychium minimum. 5 Cyclostoma elegans. 6 Acme fusca.

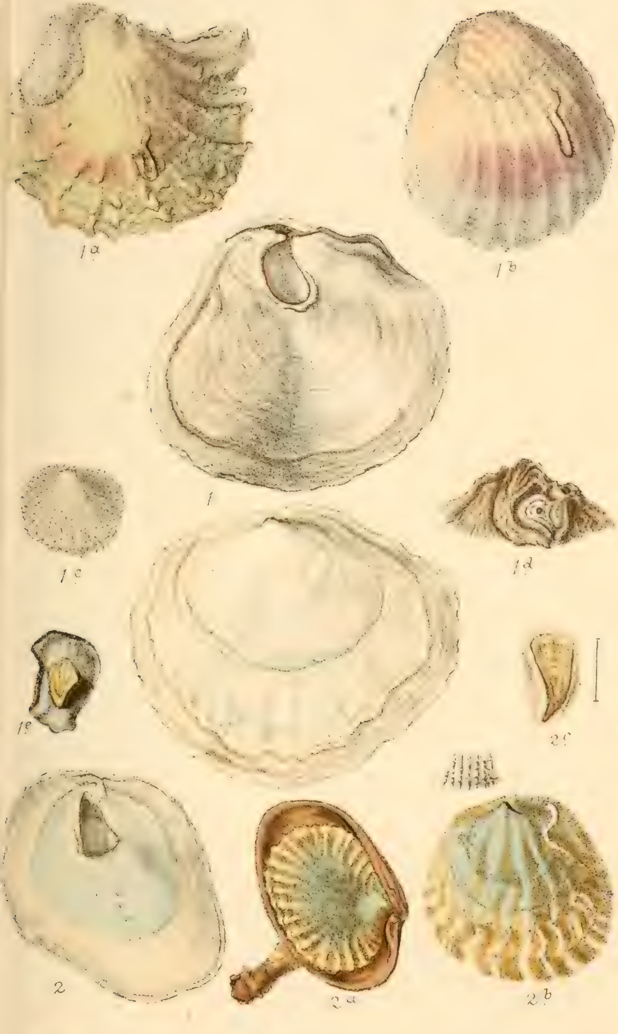
G. B. Sowerby



erebratula cranium. 2. T. caput-serpentis. 3. Argiope decollata. 4. A. cistellula. 5. A. capsula. 6. Crania anomala.

G. B. Sowerby.

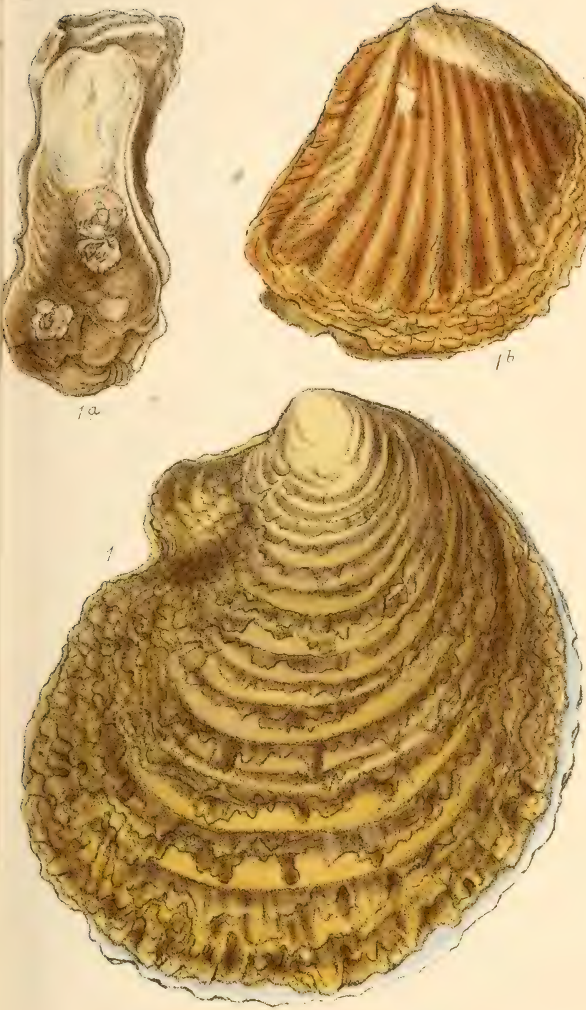
Pl. XX.


1a
1b
1
1c
1d
1e
2c
2
2a
2b

Anomia ephippium. 1^b formed on a Pecten. 1^c var. leata. 1^d foramen closed by shelly plaits. 1^e. plug 2^a *A. patelliformis*. 2^b var. striata. 2^c plug.

G. B. Sowerby.

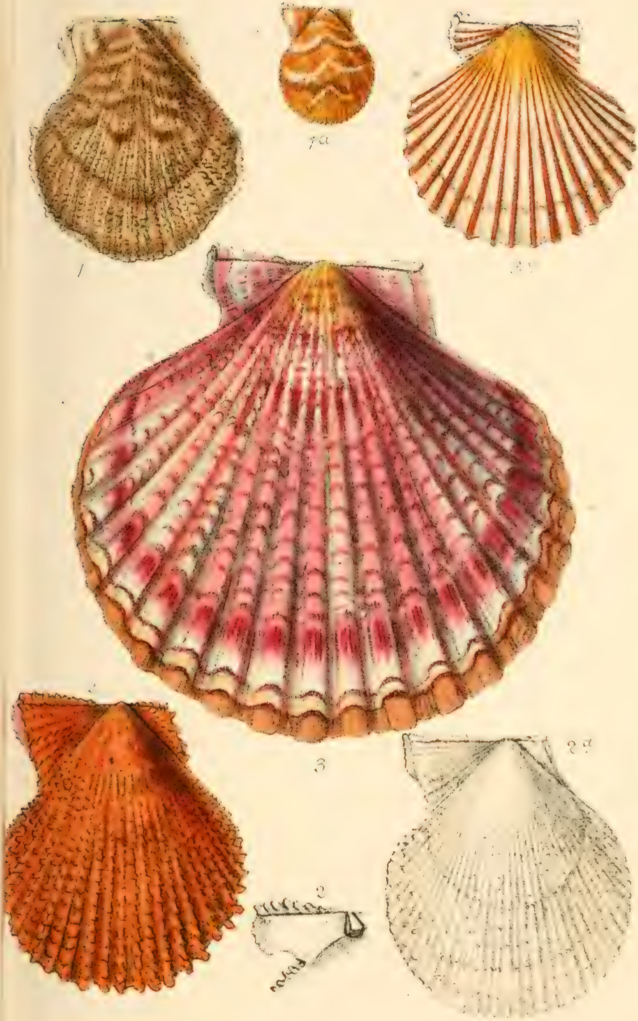
Pl. XXI.



1. Ostrea edulis; a. var. deformis; b. var. parasitica

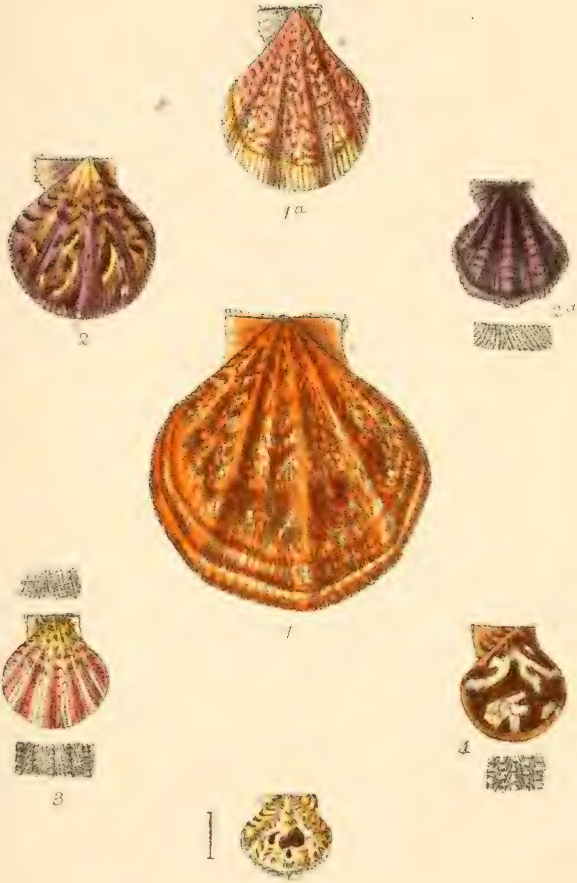
G. B. Sowerby

Pl. XXII.



1. Pecten pusio. 1a young. 2. P. varius. 2a. var. nivea.
3. P. opercularis. 3a. var. lineata.

G. B. Sowerby

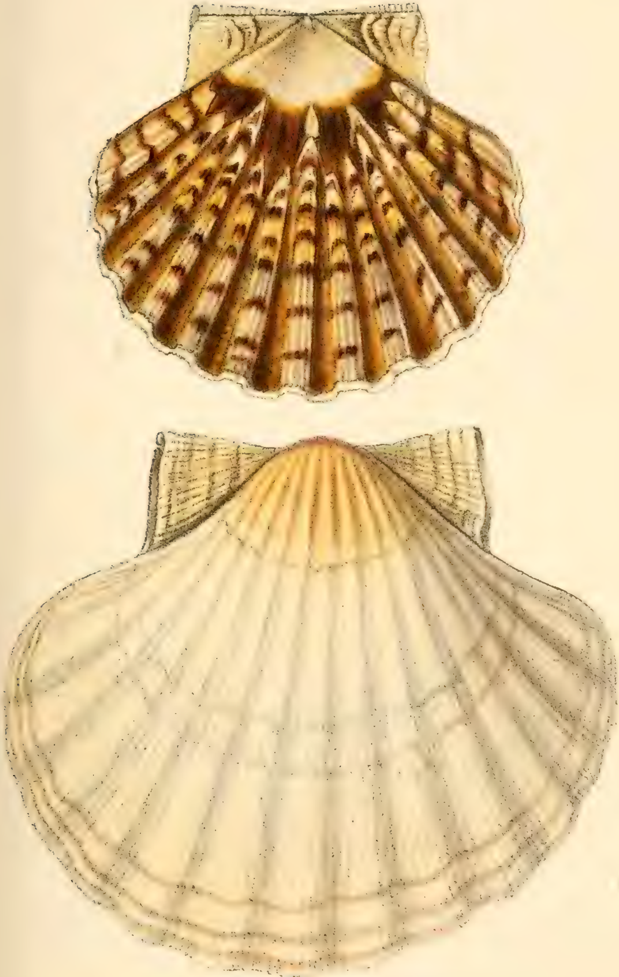


Pecten septemradiatus. 1^a var. Dumasii. 2. P. tigrinus. 2^a var. striata.
3. P. Testæ. 4. P. striatus. 5. P. similis.

imp.

G. B. Sowerby

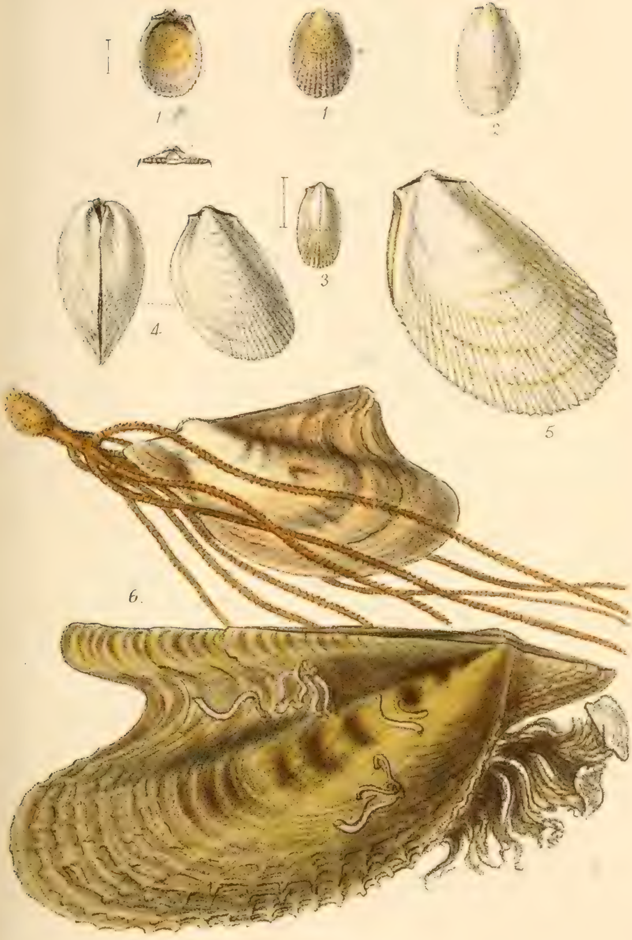
Pl. XXIV



Pecten maximus.

, imp

G. B. Sowerby

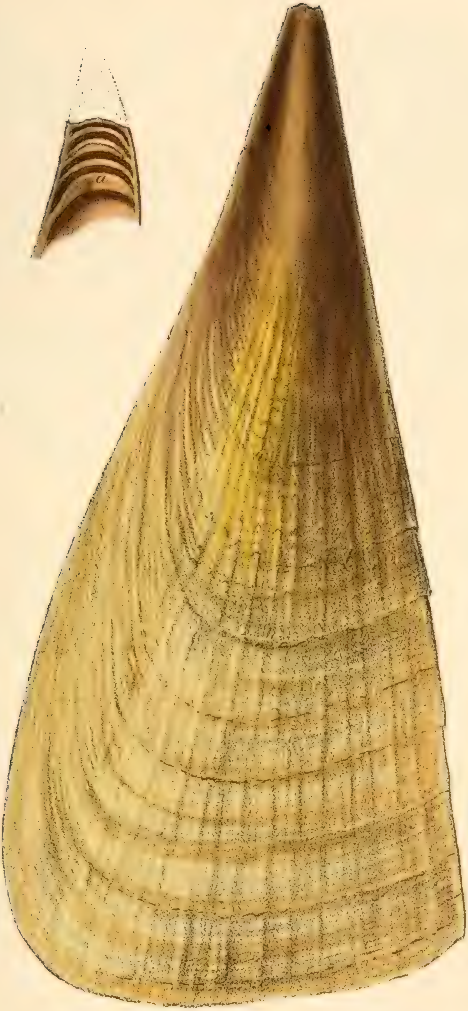


1 *Lima Sarsii* 2. *L. elliptica* 3 *L. subauriculata* 4. *L. Loscombii*
5. *L. hians*. 6 *Avicula hirundo*

imp

G. Sowerby

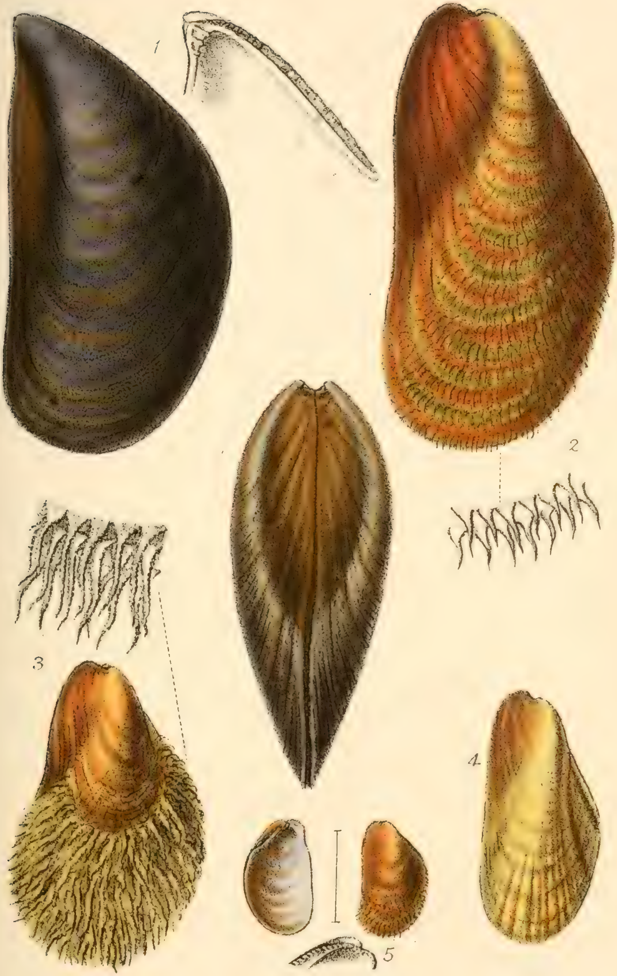
Pl. XXVI.



Pinna rudis.

t, imp

G.B. Sowerby

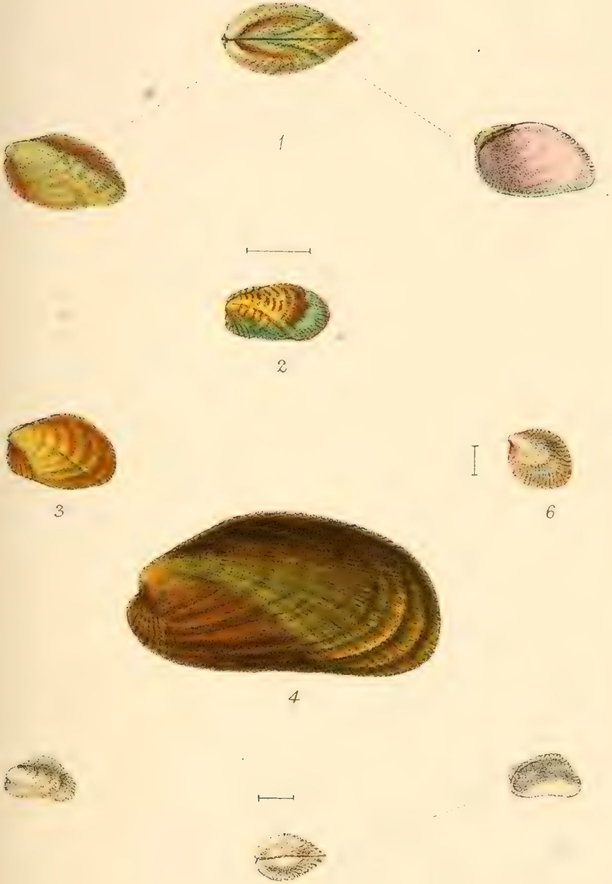


1. Mytilus edulis. 2. M. modiolus. 3 M. barbatus.

4. M. Adriaticus. 5. M. phaseolinus.

imp

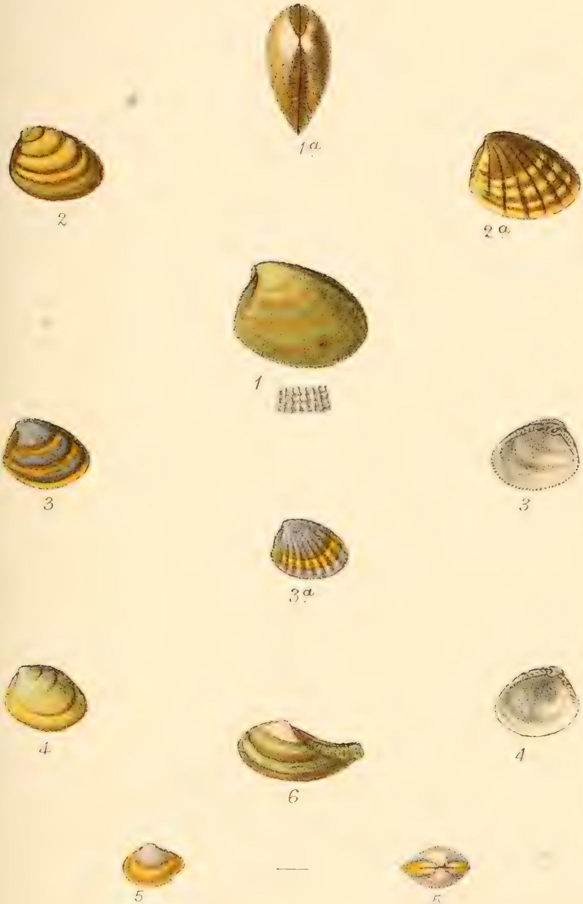
G. B. Sowerby



1 *Modiolaria marmorata.* 2 *M. costulata.* 3 *M. discors.*
4. *M. nigra.* 5. *Crenella rhombea.* 6. *C. decussata.*

mp.

G. B. Sowerby

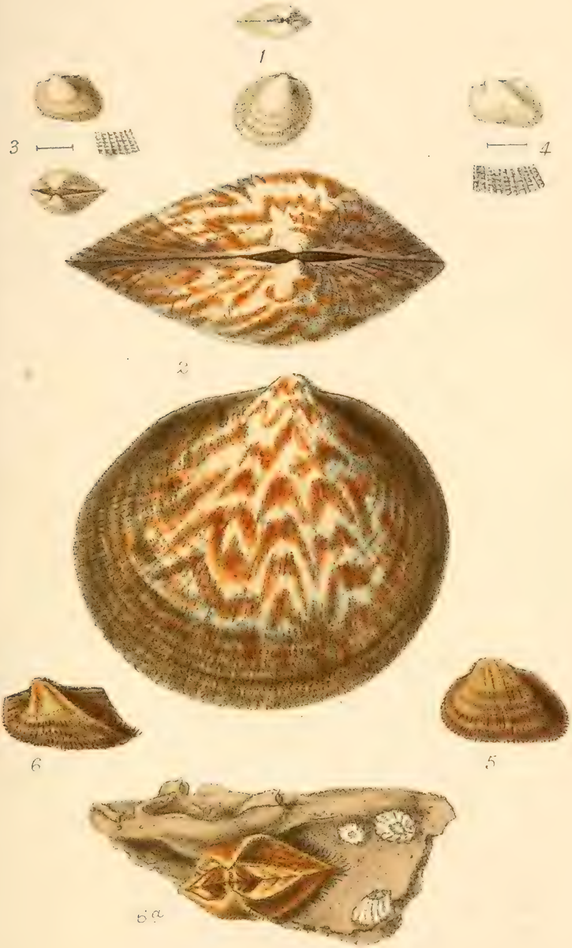

1a
2
2a
1
3
3
3a
4
6
4
5
5

ucula sulcata. 2 N nucleus 2a var radiata. 3 N. nitida 3a streaked variety. 4 N. tenuis. 5. Leda pygmæa. 6. L. minuta.

np

G.B Sowerby

Pl. XXX.

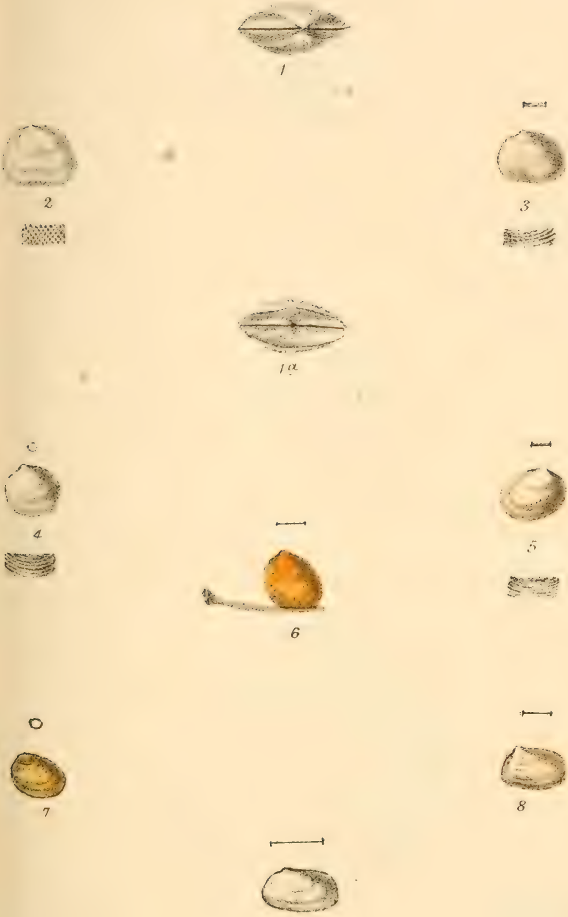


1. Limopsis aurita. 2. Pectunculus glycimeris. 3. Arca pectunculoides.
4. A. obliqua. 5. A. lactea. 6, 6a. A. tetragona.

, imp.

G. B. Sowerby

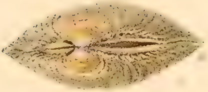
Pl. XXXI.



aleomma Turtoni. 2 Lepton squamosum. 3. L. nitidum.
lcatulum. 5 L. Clarkiæ. 6 Montacuta substriata. 7 M. Dawsoni.
8. M. bidentata. 9. M. ferruginosa.

G.B. Sowerby

Pl. XXXII.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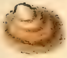
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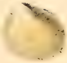
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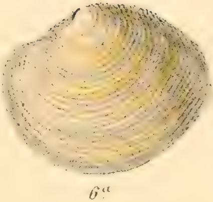
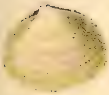

6.ª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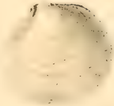
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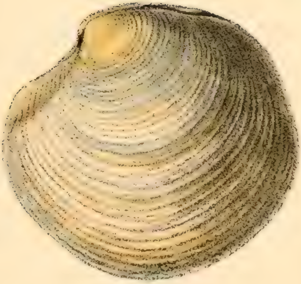
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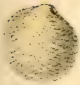
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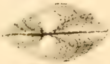
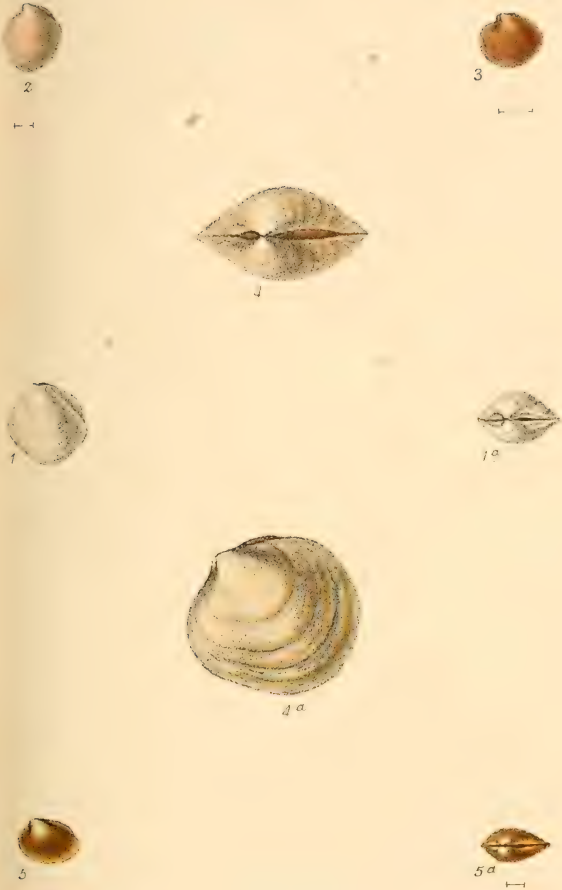

4.ª

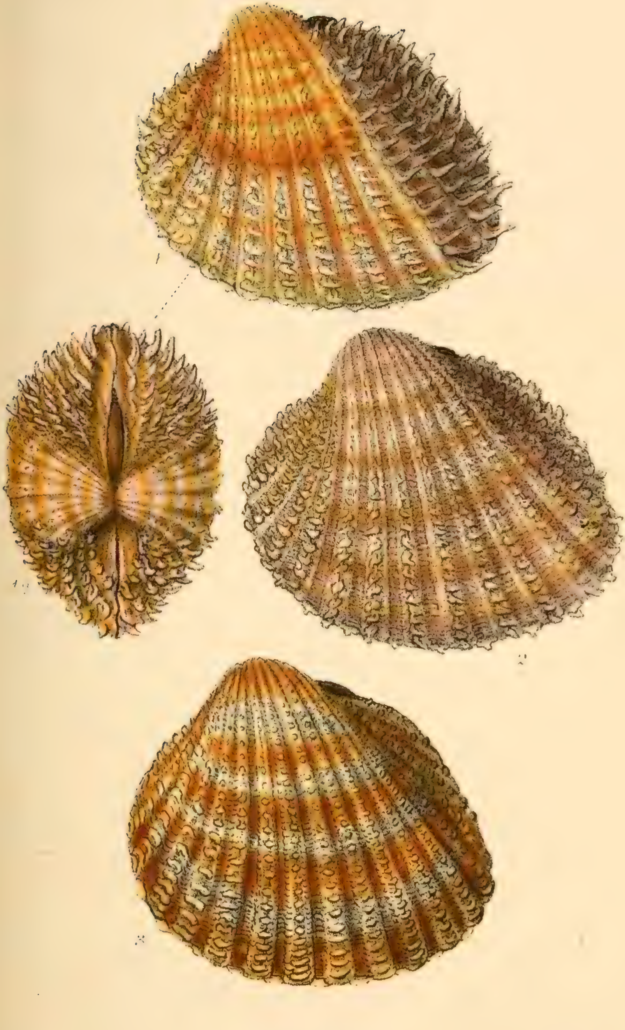
Lasœa rubra. 2. Kellia suborbicularis. 3. K.ª cycladia.
ª Loripes lacteus. 5. L. divaricatus. 6. Lucina spinifera.
ᶜ imp. 7. L. borealis. G. B. Sowerby.


2
3
4
1
1a
4a
5
5a

Axinus flexuosus. 2. A Croulinensis 3. A. ferruginosus

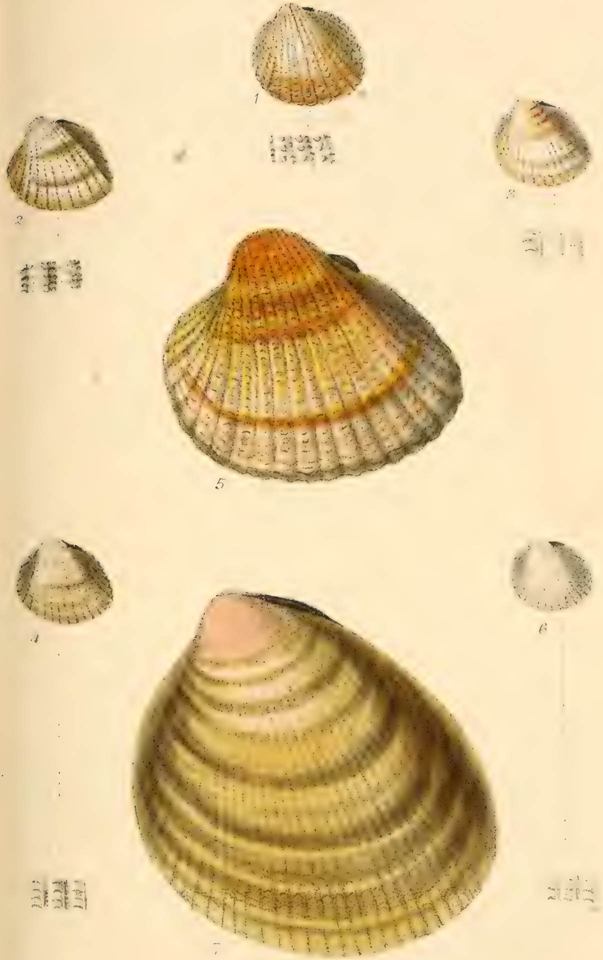
4 4.^{a} Diplodonta rotundata 5 5.^{a} Cyamium minutum.

G. B. Sowerby.



1.1a Cardium aculeatum. 2. C. echinatum. 3. C. tuberculatum.

West & Cº imp.
G.B. Sowerby.



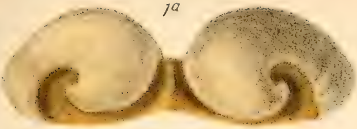
Cardium papillosum. 2. C. exiguum. 3. C. fasciatum. 4. C. nodosum.

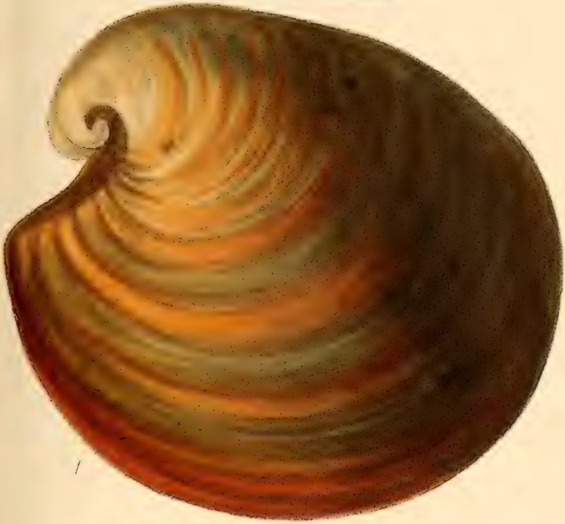
5. C. edule. 6. C. minimum. 7. C. Norvagicum.

st & Cº imp

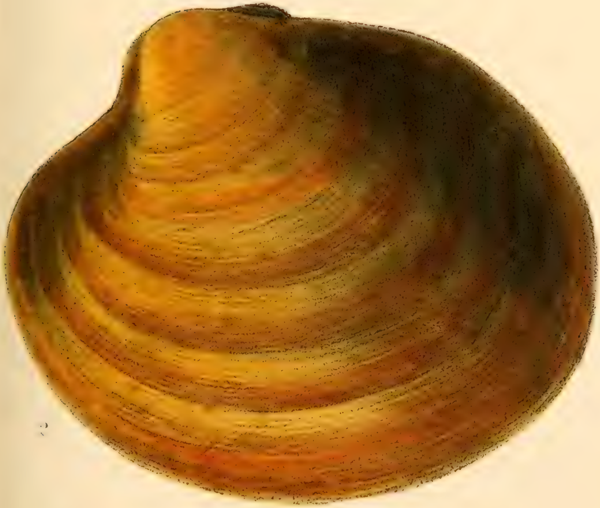
G. B. Sowerby

1a





1

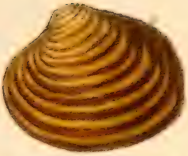


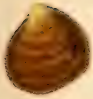
2

1, 1a Isocardia cor. 2. Cyprina Islandica.

West & C° imp.

G. B. Sowerby





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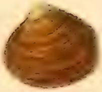

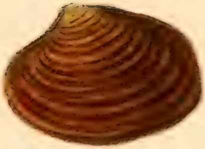

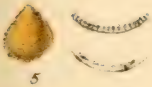

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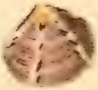
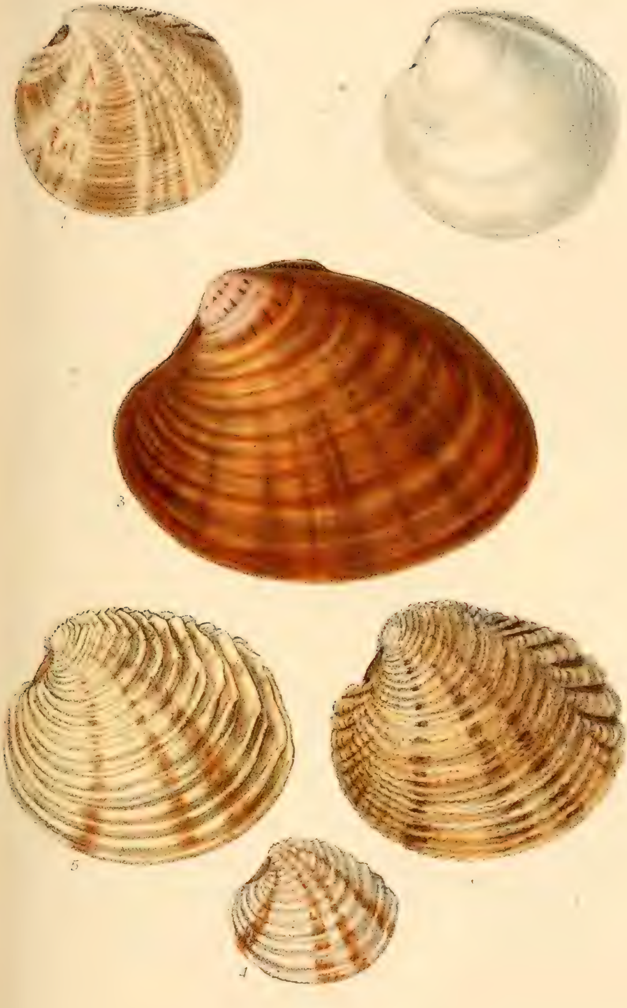


1. *Astarte sulcata.* 2. *do. var. elliptica.* 3. *A. compressa.*
4. *do. var. striata.* 5. *A. triangularis.*
6. *Circe minima.*

Pl. XXXVIII.

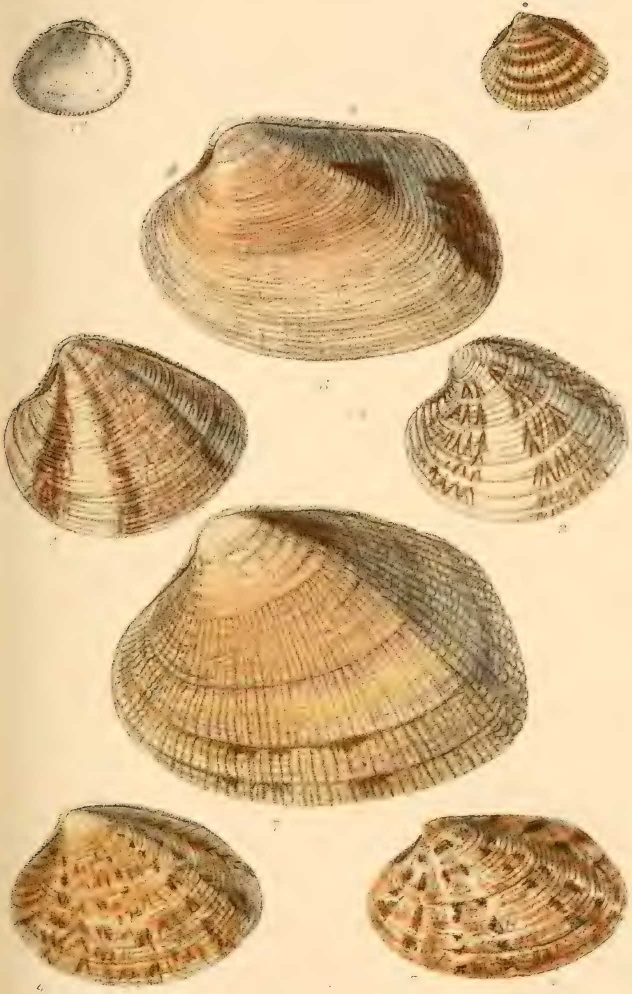


1. Venus exoleta. 2. V. lincta. 3. V. chione.

4. V. fasciata. 5. V. casina. 6. V. verrucosa.

G. B. Sowerby.

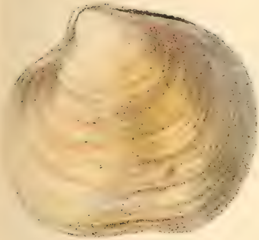
Pl. XXXIX.



Venus ovata. 2. V. gallina. 3 do. var. gibba. 4. Tapes aureus

5. T. virgineus. 6. T. pullastra. 7. T. decussatus

G.B Sowerby



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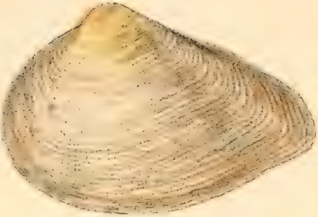
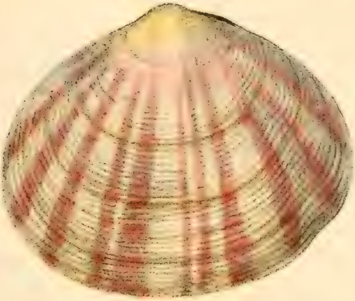


2



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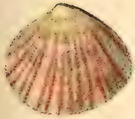

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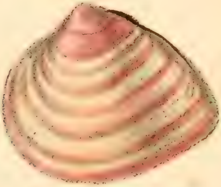


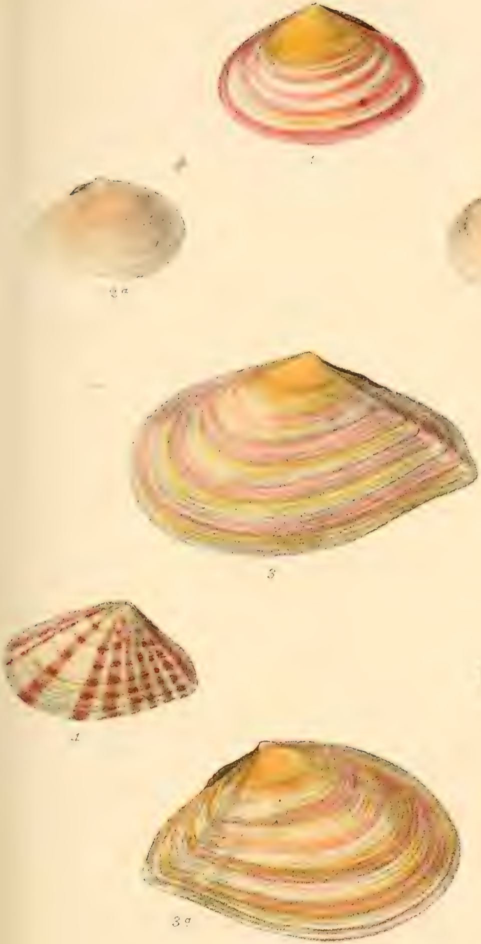
5

1. *Lucinopsis undata.* 2. *Gastrana fragilis.*
3. *Tellina balaustina* 4. *T. crassa.* 5. *T. balthica.*

imp

G. B. Sowerby

Pl. XLI.

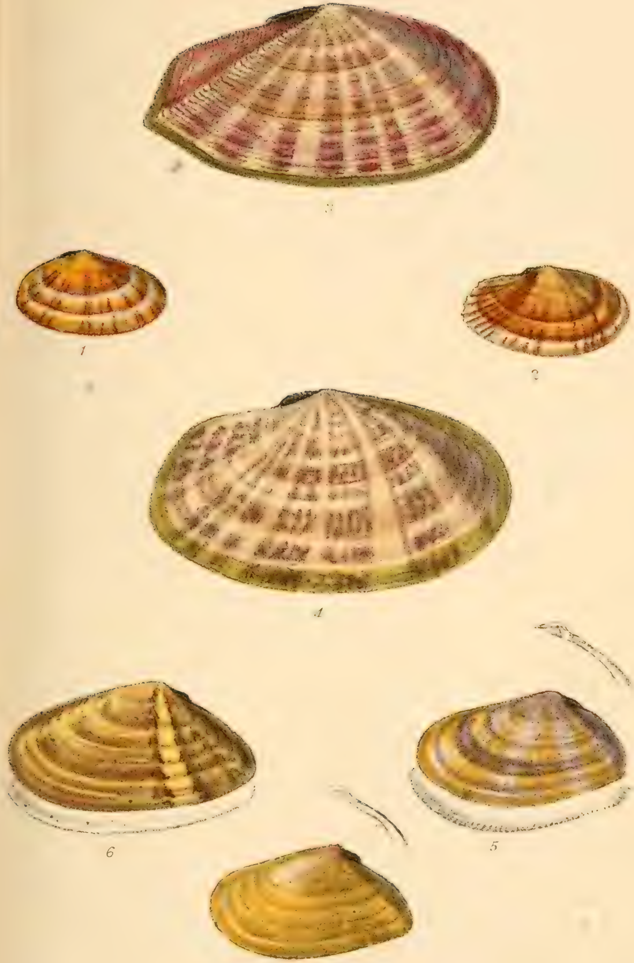


1 Tellina tenuis. 2. T. fabula. 3. T. squalida.

4. T. donacina. 5. T. pusilla.

G B Sowerby

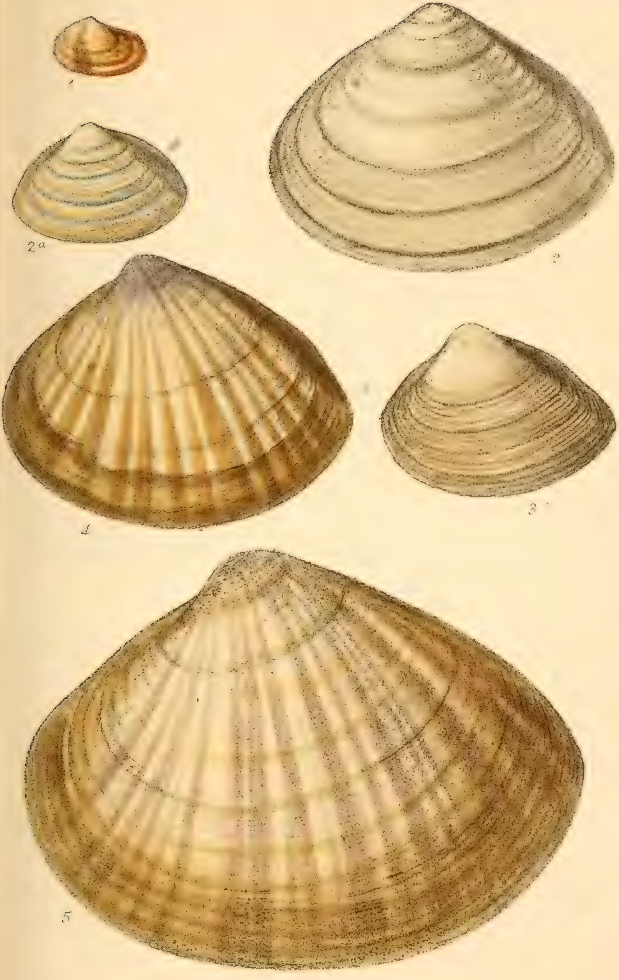
Pl. XLII.



Psammobia tellinella. 2 P. costulata 3 P. Ferröensis.
vespertina 5. Donax vittatus. 7 D. trunculus 6 D. politus

G. B. Sowerby

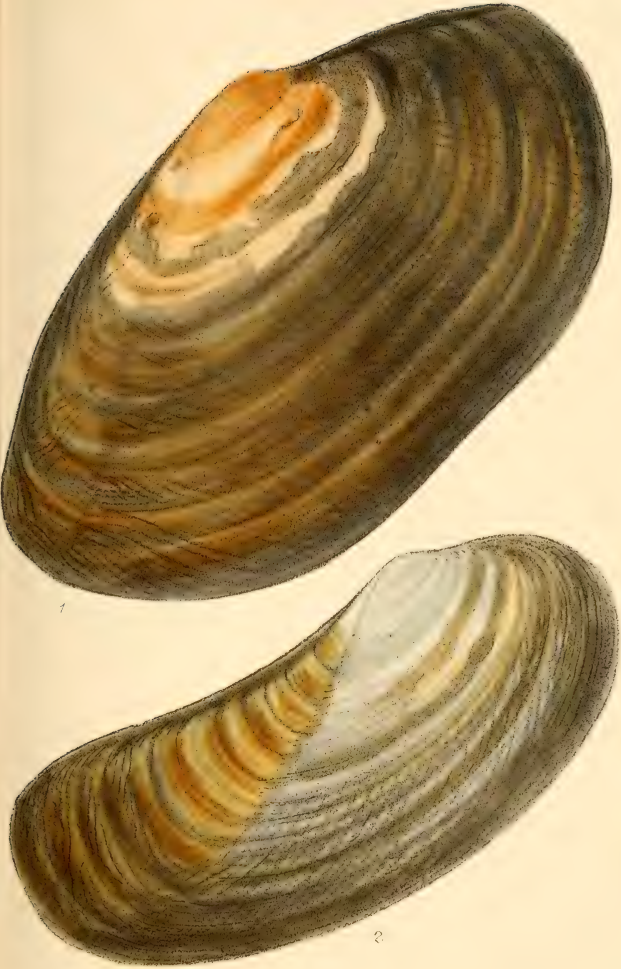
Pl. XLIII.



mphidesma castaneum. 2 Mactra solida. 2^a do var elliptica.
3. M. subtruncata. 4. M. stultorum 5. M. glauca.

G. B. Sowerby.

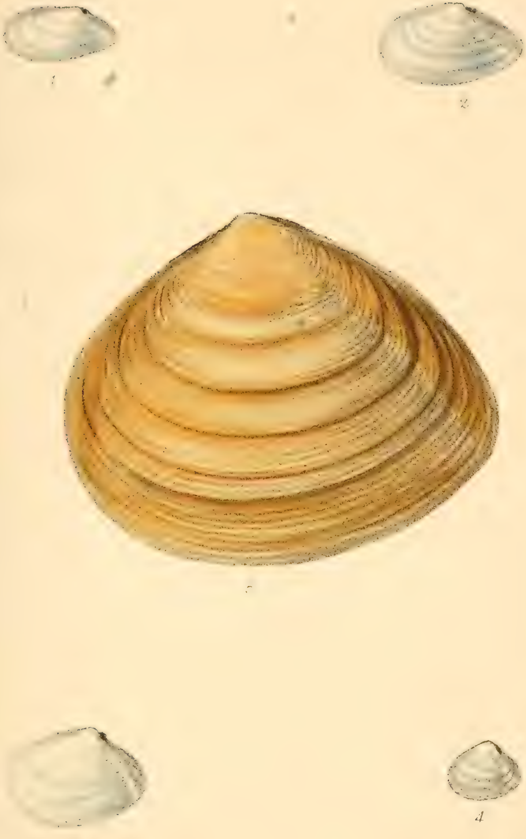
Pl. XLIV.



1. Lutraria elliptica: 2. L. oblonga

mp.

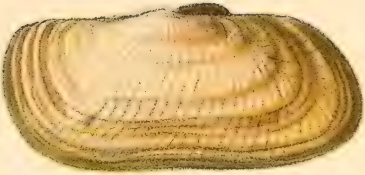
G. B. Sowerby



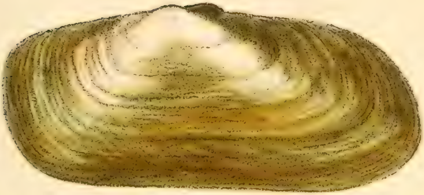
1. Scrobicularia prismatica 2. S nitida. 3 S. alba.

4. S. tenuis. 5. S. piperata.

mp. G. B. Sowerby



1



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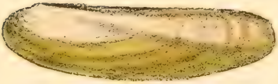

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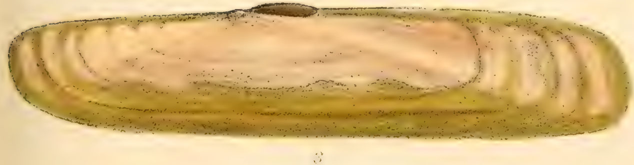


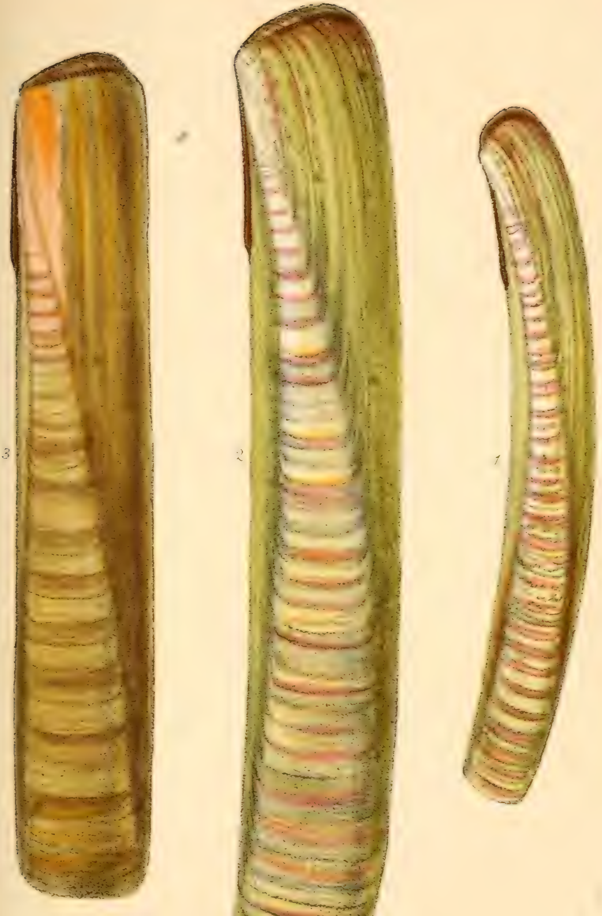
3

Solecurtus candidus 2. S antiquatus 3 Ceratisolen legumen

4. Solen pellucidus.

np G. B. Sowerby

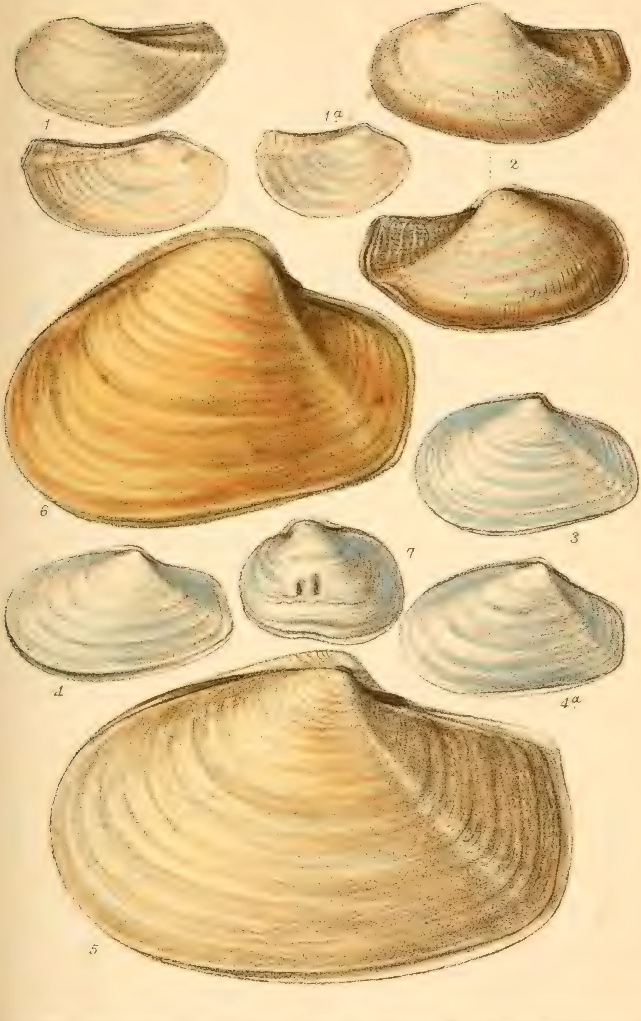
Pl. XLVII.



1. Solen ensis. 2. S. siliqua. 3. S. vagina.

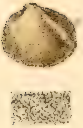
G.B Sowerby.

Pl. XLVIII.



Pandora inæquivalvis. 1^a do var obtusa. 2. Lyonsia Norvegica.
Thracia prætenuis 4. T papyracea 4^a do var. villosiuscula
5. T. pubescens. 6. T. convexa. 7. T. distorta.

imp. G. B. Sowerby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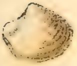
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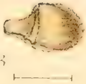
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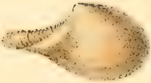
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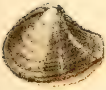
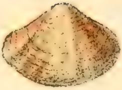
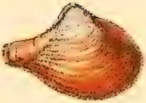

6


6

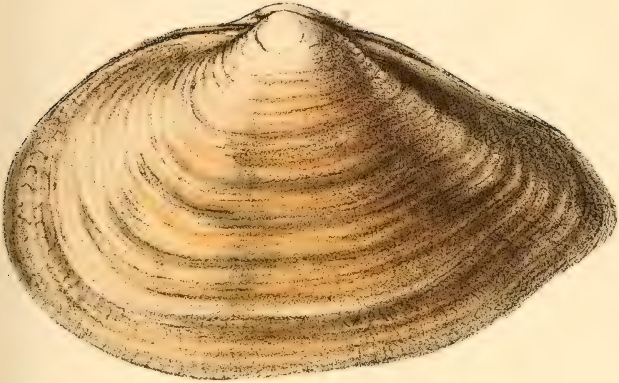

5

romya granulata. 2. Neæra abbreviata. 3. N. costellata
4. N. rostrata. 5. N. cuspidata. 6. Corbula gibba

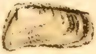
p.

G.B. Sowerby

Pl. L



1



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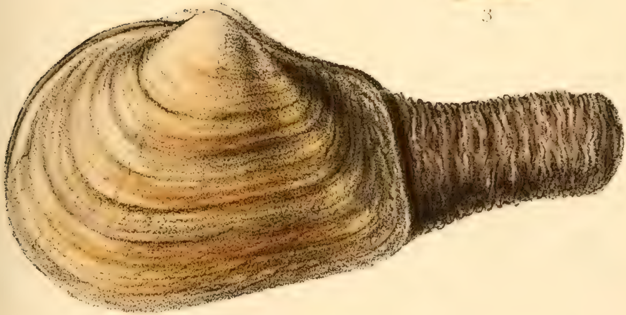
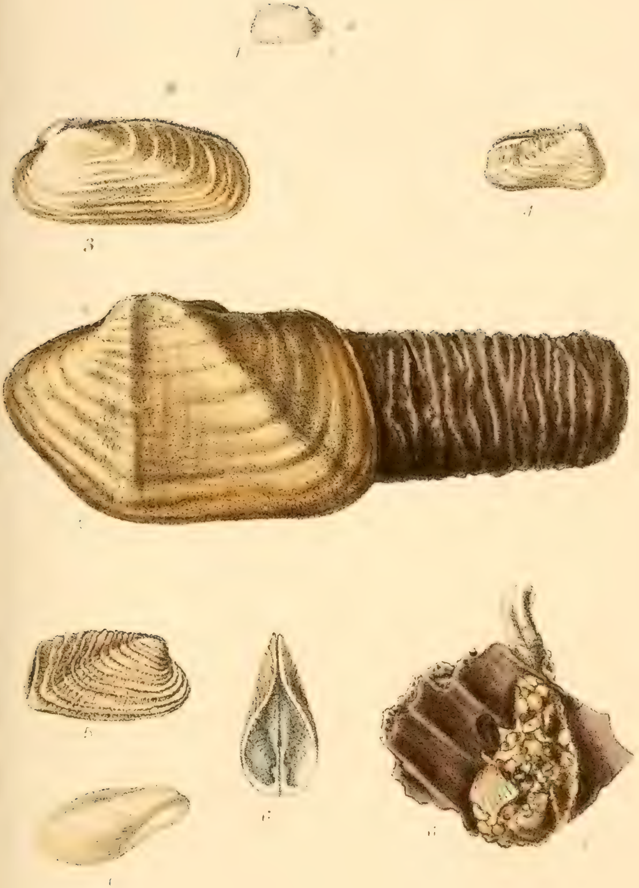


2

1. *Mya arenaria.* 2. *M. truncata.* 3. *M. Binghami.*

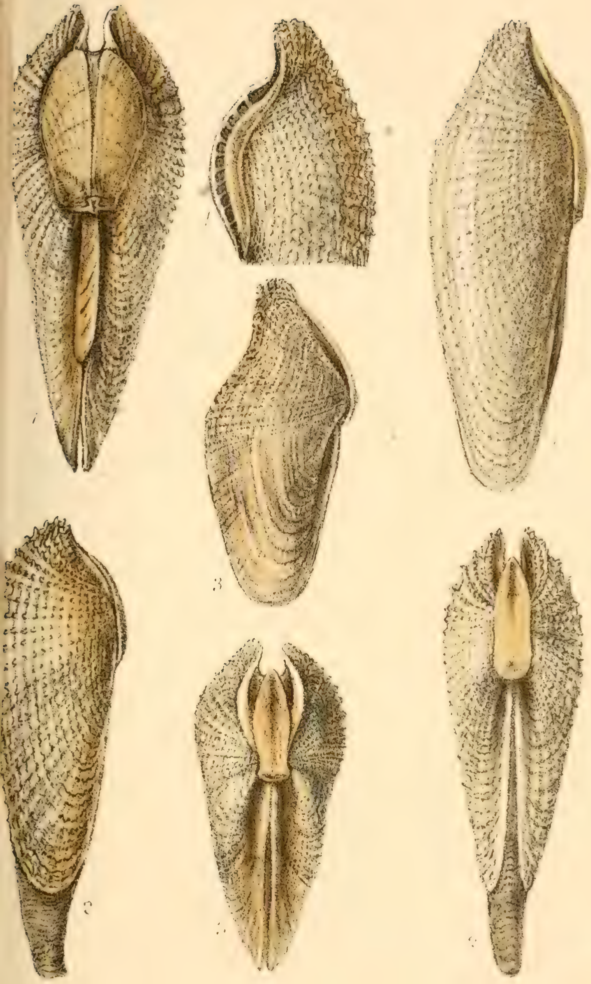
imp

G. B. Sowerby



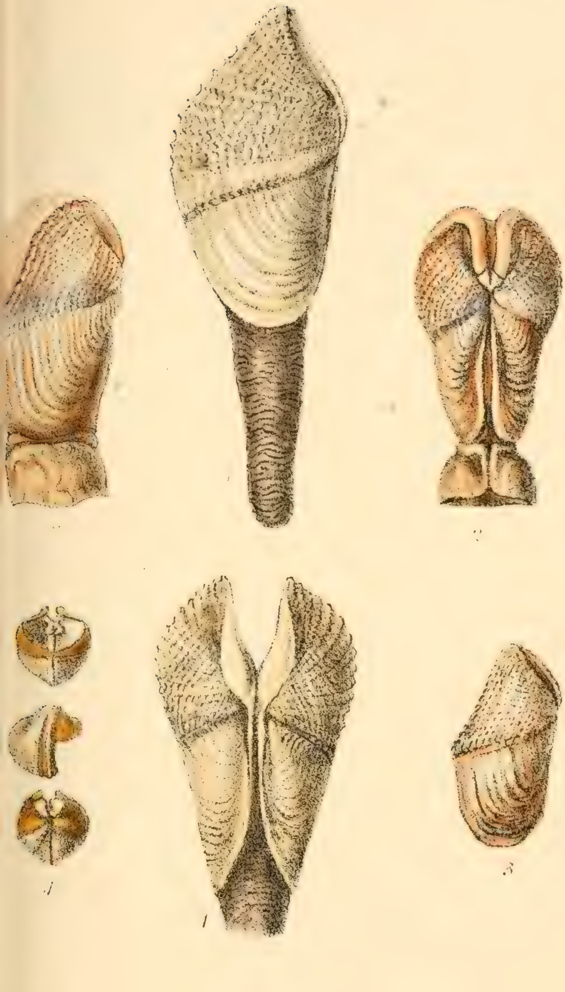
Panopea plicata 2 Saxicava norvegica 3. S rugosa
do var arctica 5. Venerupis Irus 6 Gastrochaena modiolina

mp [illegible]



Pholas dactylus 2 P. candida. 3. P. parva

Pl. LIII

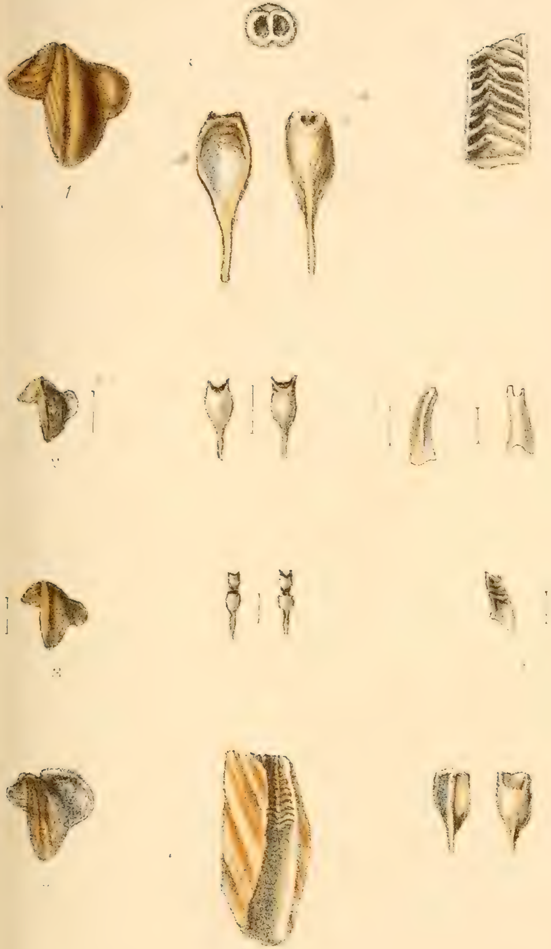


crispata. 2. Pholadidea papyracea 3. d.^o young.

4. Xylophaga dorsalis

G. B. Sowerby

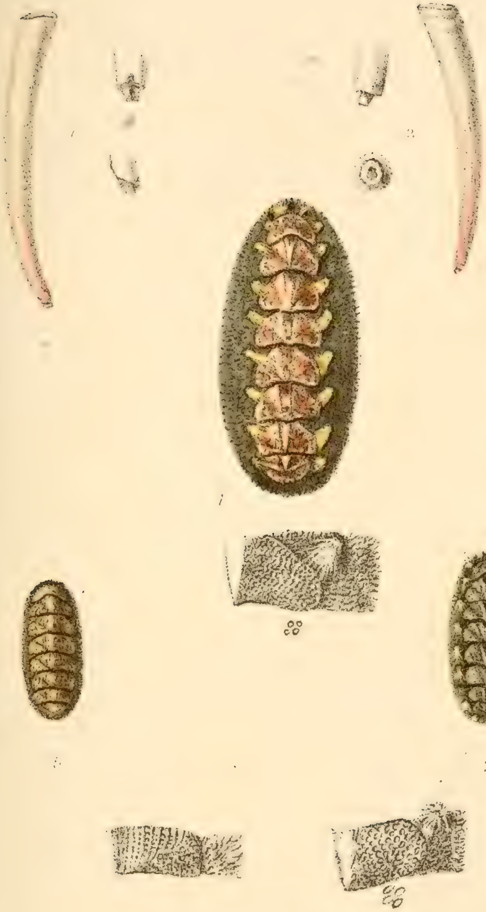
Pl LIV



redo Norvegica 2. T. navalis. 3. T. pedicellata
4. T. megotara.

G.B. Sowerby

Pl. LV.

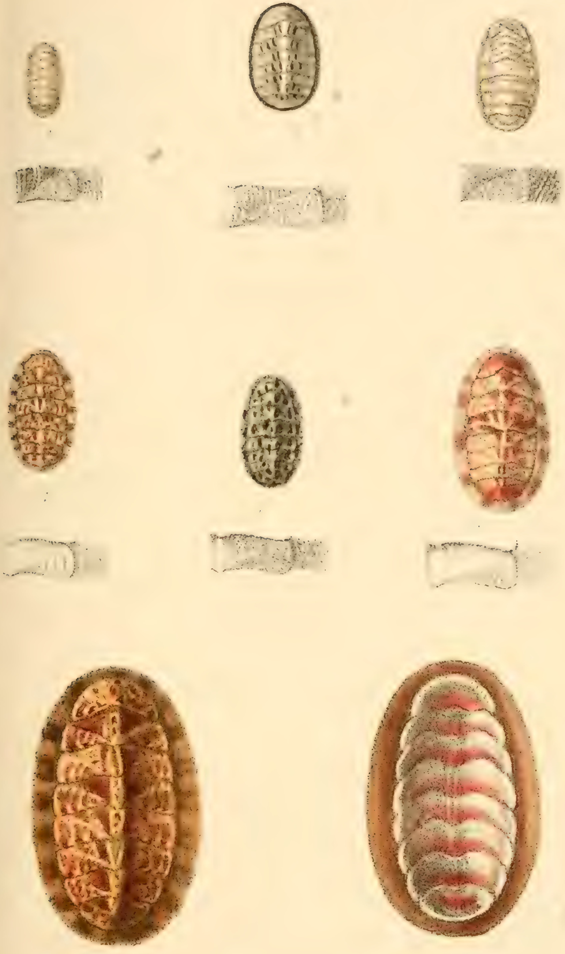


entalium entalis 2. D. Tarentinum 3. Chiton fascicularis

4. C. discrepans. 5. C. Hanleyi

n.p. G.B. Sowerby.

Pl. LII

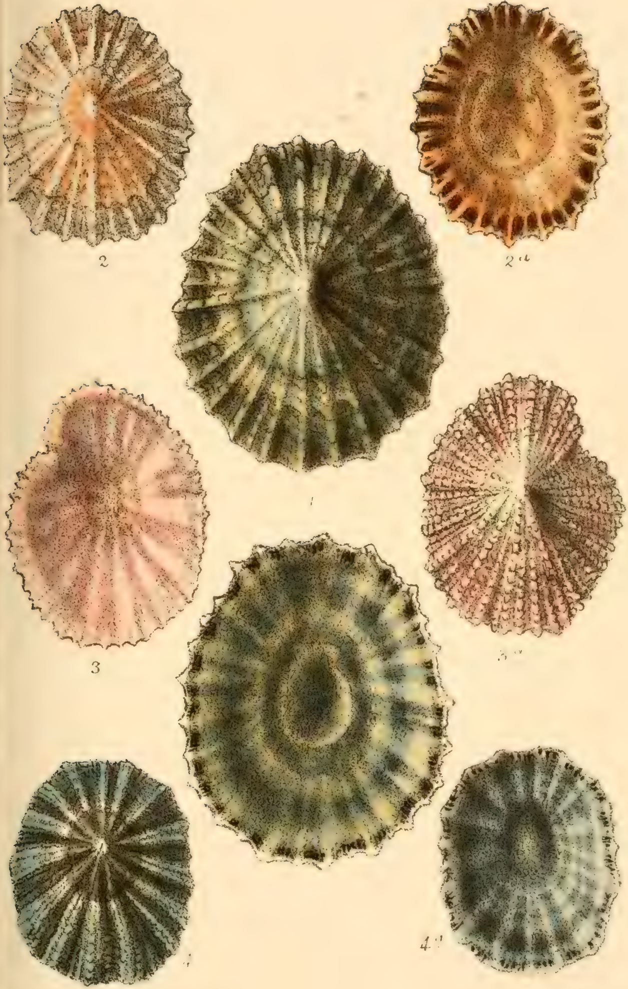


Chiton cancellatus. 2. C cinereus. 3 C. albus. 4. C. ruber

. marginatus. 6. C lævis. 7 C. marmoreus

G. B. Sowerby.

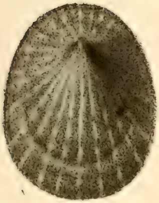
Pl. LVII.


2
2a
1
3
3a
4
4a

atella vulgata. 2. do. var. intermedia. 3. do. var. depressa

4. do. var. cœrulea

imp. G. B. Sowerb



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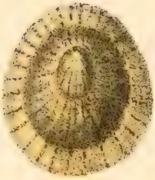
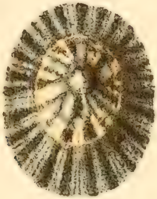


2



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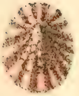

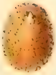

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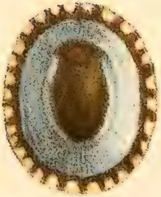

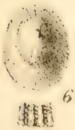

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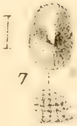
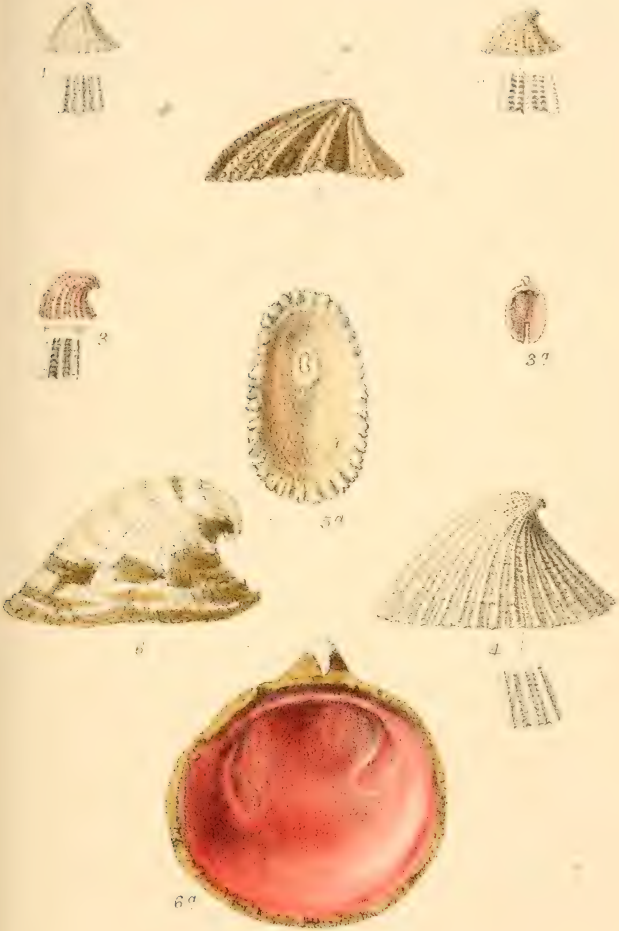


7

on pellucidum. 2. do. var lævis. 3. Tectura testudinalis. 4. T. virginea
5. T. fulva. 6. Lepeta cæca. 7. Propilidium ancyloides

imp. G. B. Sowerby

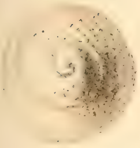


'uncturella Noachina 2. Emarginula fissura. 3. E. rosea

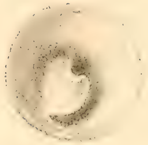
. crassa. 5 Fissurella Græca. 6. Capulus Hungaricus.

mp G B Sowerby

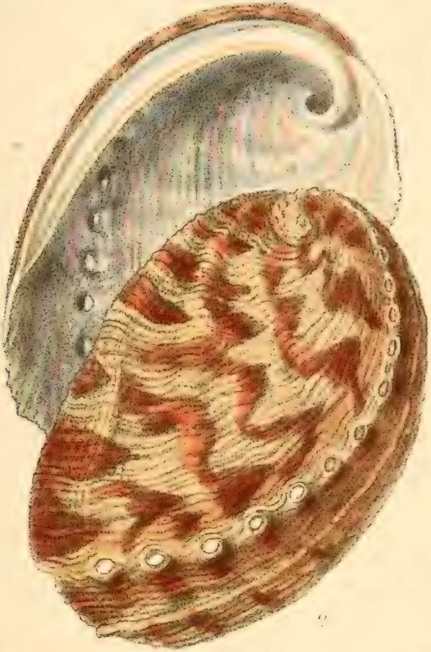
Pl. IX.



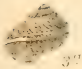
1



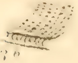
1a



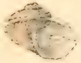
2



3a



3b



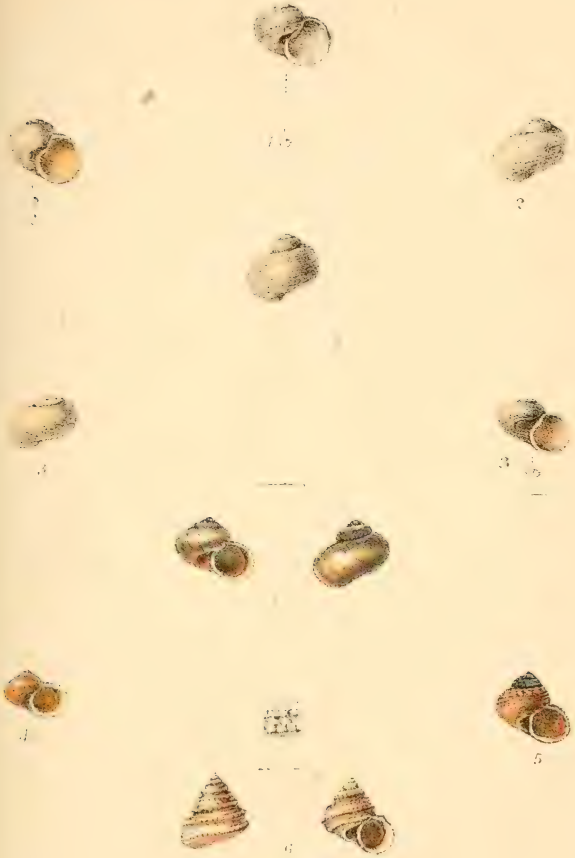
3

1. *Calyptræa Chinensis.* 2. *Haliotis tuberculata*

3. *Scissurella crispata*

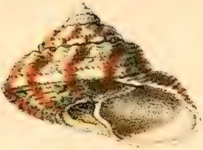
l, imp.

G. B. Sowerby

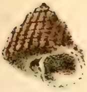


yclostrema Cutlerianum. 2. C. nitens. 3. C. serpuloïdes
chus helicinus. 4ª do. male. 5. T. Grœnlandicus. 6. T. amabilis

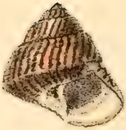
n.
G. B. Sowerby

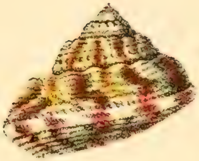


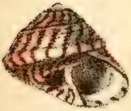
1



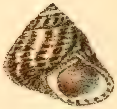
2







4



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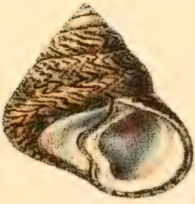

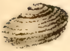

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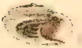
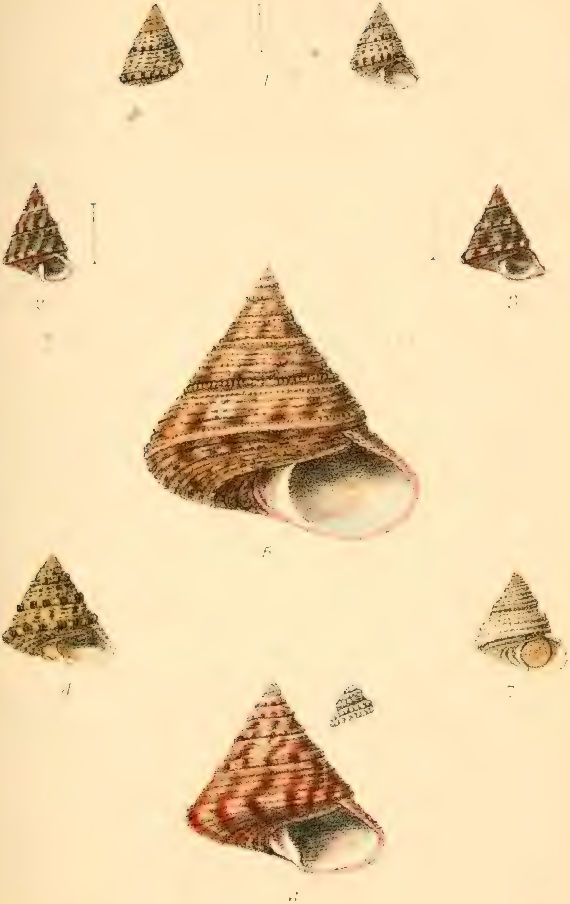


rochus magus. 2. T. tumidus. 3. T. cinerarius. 4. T. umbilicatus
4ª do. var. Agathensis. 5. T. Duminyi. 6. T. lineatus.

t, imp

B. Sowerby

Pl. LXIII

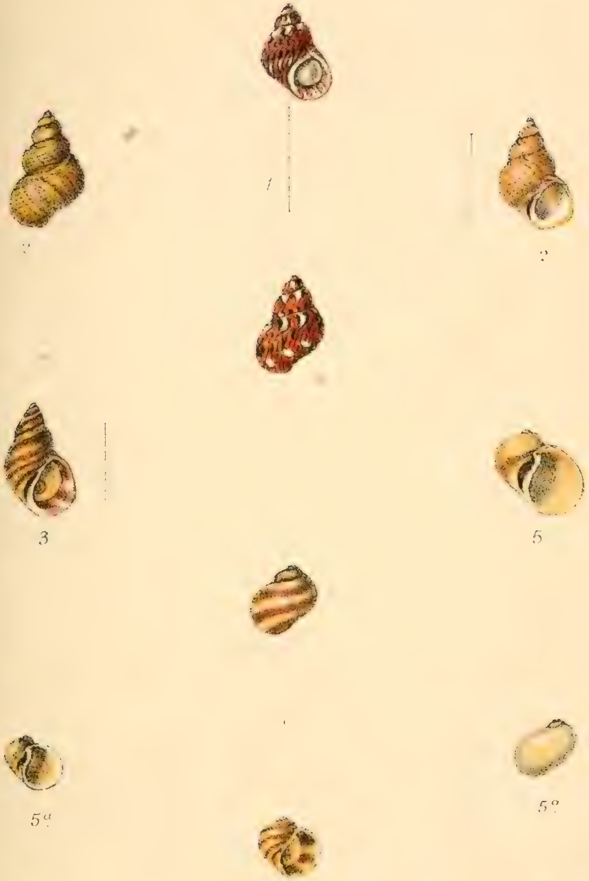


rochus Montacuti 2. T. striatus. 3. T. exasperatus 4. T. millegranus

5 T. granulatus 6 T. zizyphinus. 7. T. occidentalis.

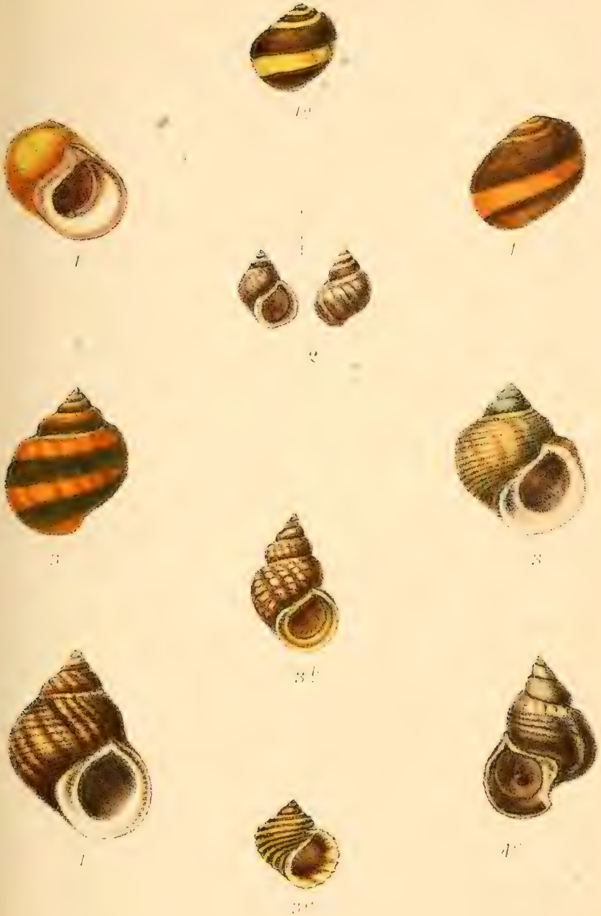
imp

Pl. LXIV.



1. *Phasianella pulla* 2. *Lacuna crassior* 3. *L. divaricata.*
4. *L. puteolus.* 5. *L. pallidula.* 5ª do var *neritoidea*

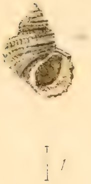
imp
G. B. Sowerby


1a
1
1
2
3
3
3b
1
4a
3a

torina obtusata. 1^a do var. ornata. 2 L. neritoides. 3. L. rudis.
ar. jugosa. 3^b do var. tenebrosa. 4. L. litorea. 4^a do. var. sinistrorsa.

.p G. B Sowerby

Pl. LXVI.



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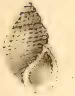

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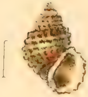

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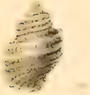

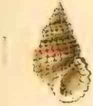

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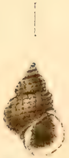

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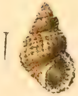

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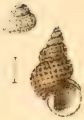

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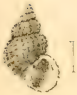

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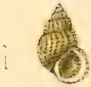
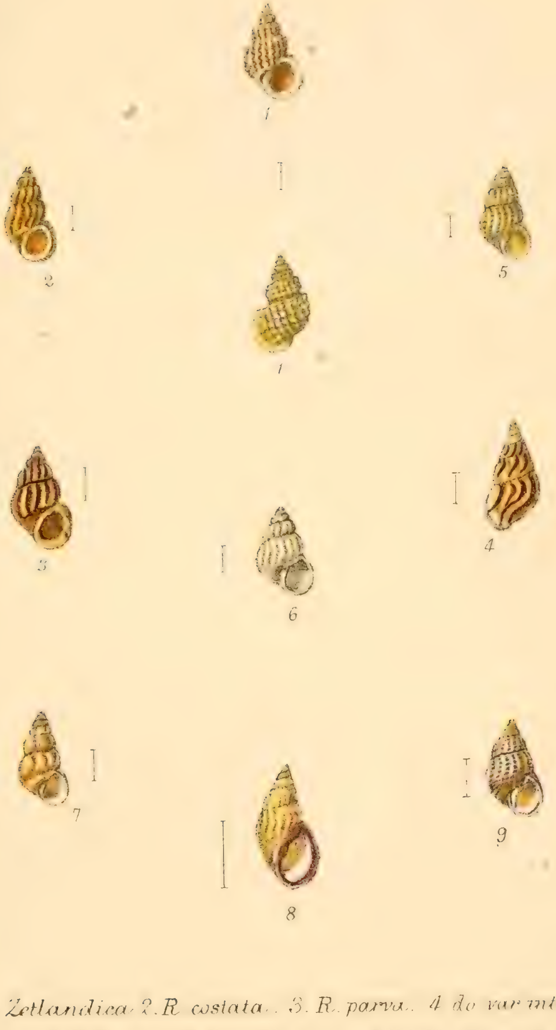


9

ssoa striatula. 2. R. lactea. 3. R. cancellata. 4. R. calathus.
.reticulata. 6. R. cimicoïdes. 7. R. Jeffreysi. 8. R. punctura.
np. 9. R. abyssicola. G.B. Sowerby.

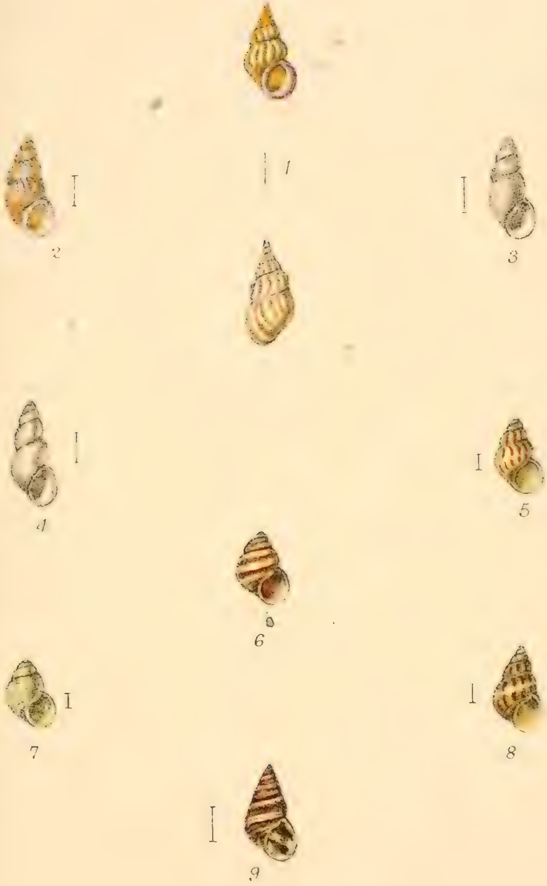
Pl. LXVII.



1. Rissoa Zetlandica 2. R costata. 3. R. parva. 4 do var interrupta
R inconspicua 6. R albella. 7. do var. Sarsii. 8. R membranacea 9. R violacea

W. West imp. G. B. Sowerby.

Pl. LXVIII.

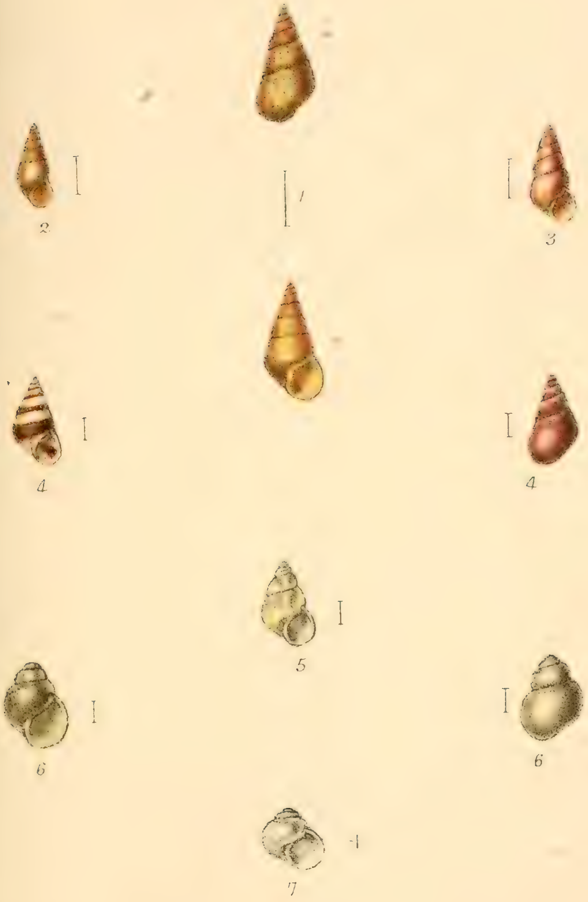


Rissoa costulata. 2. R. striata. 3. R. proxima. 4. R. vitrea.
pulcherrima 6. R fulgida. 7. R soluta 8. R semistriata 9 R angillus

est, imp

G. B. Sowerby

Pl. LXIX.

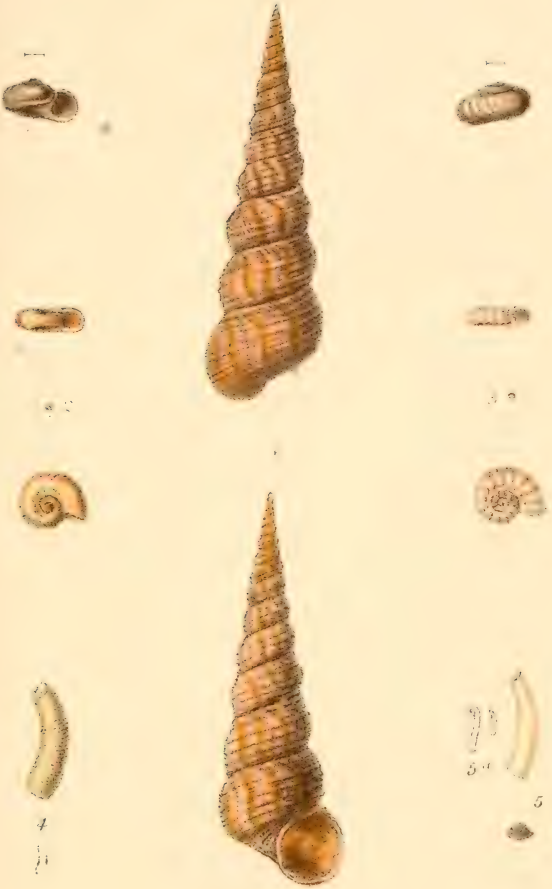


1. Hydrobia ulvæ. 2. do. var. Barleei 3. do. var. octona.

Barleeia rubra. 5. Jeffreysia diaphana 6. J. opalina. 7. J. globularis.

W. West, imp.

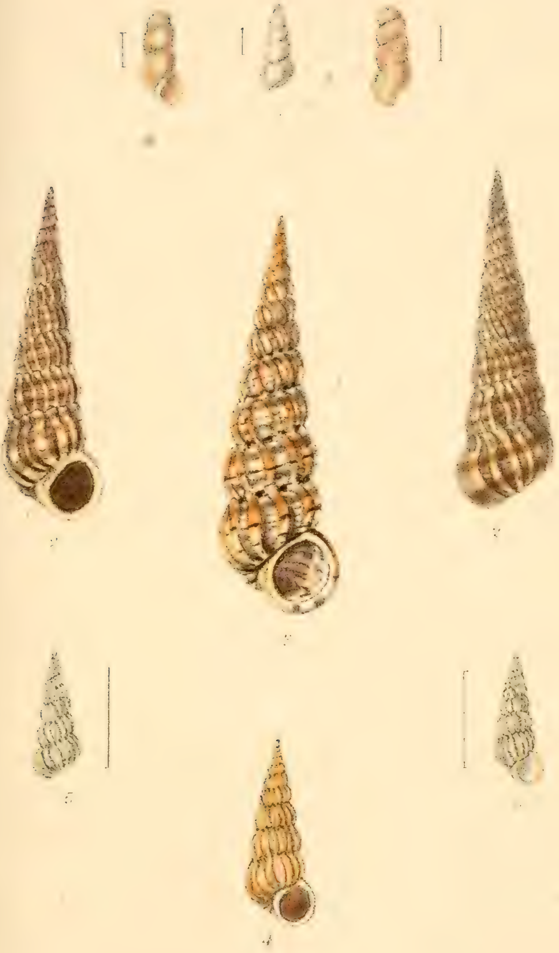
G B Sowerby



1 Skenea planorbis. 2. Homalogyra atomus 3. H rota 4 Caecum trachea
5. C. glabrum. 5.a, do. young. 6. Turritella terebra.

W. West. imp G B Sowerby

Pl. LXXI

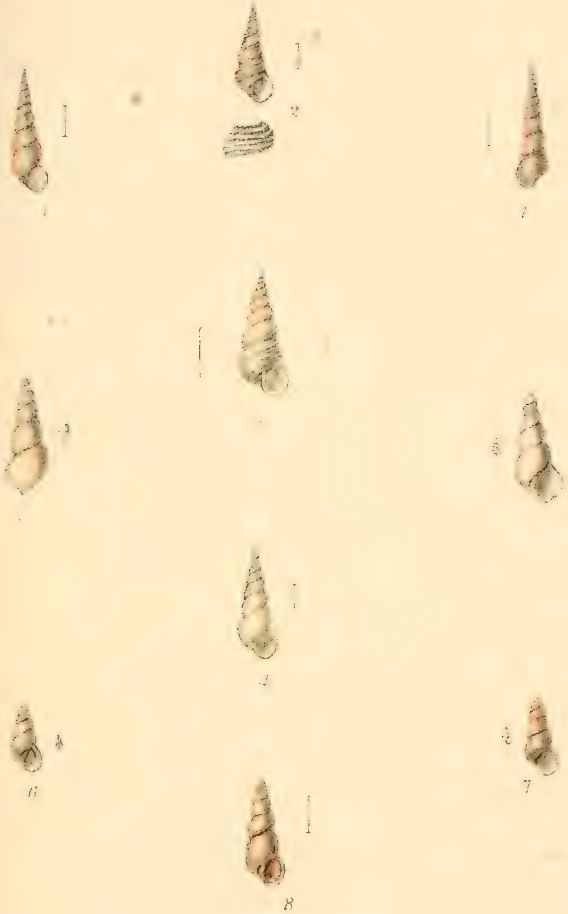


1. Truncatella truncatula 2. Scalaria Turtonæ. 3. S. communis.

4. S. Trevelyana. 5. S. clathratula.

West. imp.

G. B. Sowerby

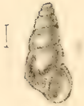


1. Aclis unica. 2. A. ascaris 3. A. supranitida. 4. A. Walleri.
5. A. Gulsonæ. 6. Odostomia minima. 7. O. nivosa. 8. O. truncatula

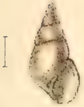
West. imp.

G. B. Sowerby

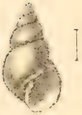
Pl. LXXIII.



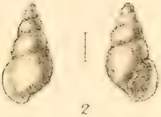
1



3



4.



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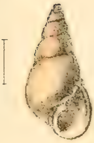

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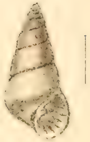

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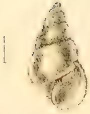

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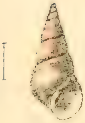

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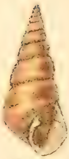

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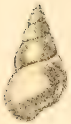
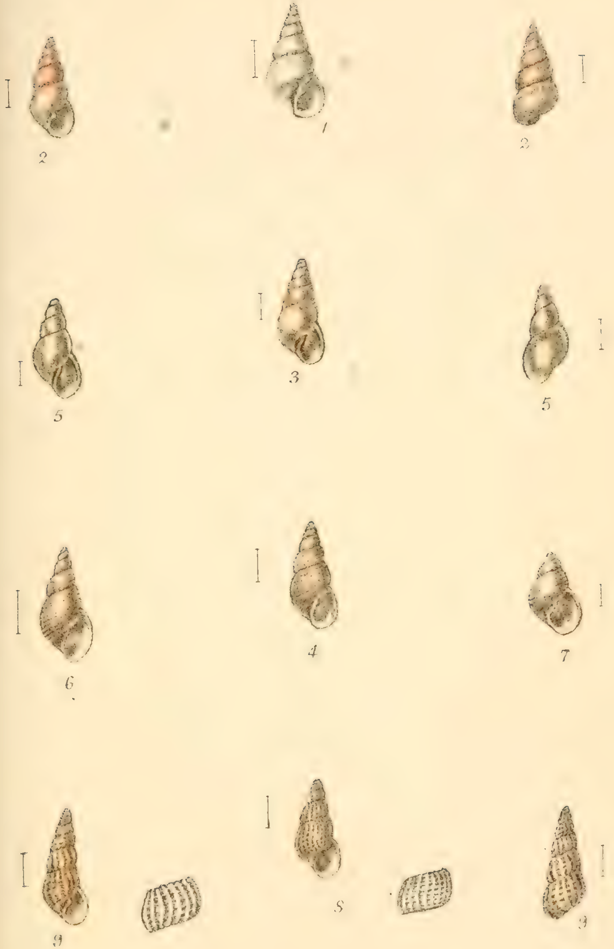


1. Odostomia clavula. 2. O. Lukisi. 3. O. albella. 4. O. rissoïdes.
O pallida. 6. O. conoidea. 7. O. umbilicaris. 8. O. acuta. 9. O. conspicua.

st. imp

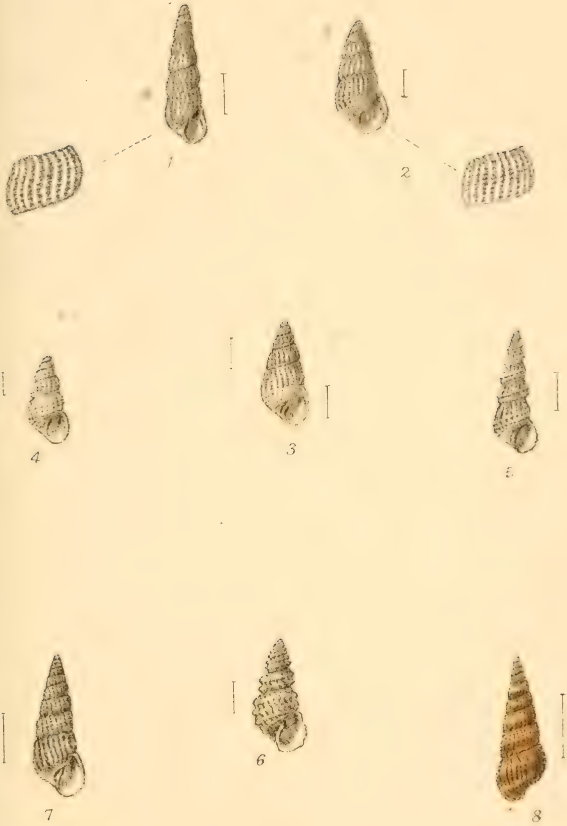
G. B. Sowerby

Pl. LXXIV.



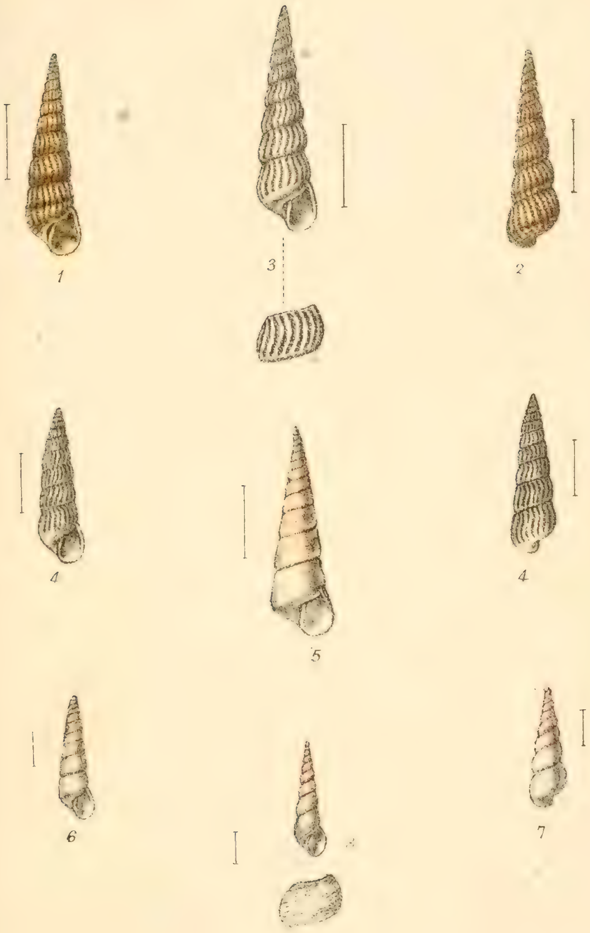
dostomia unidentata 2. O turrita. 3 O. plicata 4. O insculpta
diaphana 6 O. obliqua. 7. O. dolioliformis. 8. O. decussata
np *9. O. clathrata.* G. B Sowerby

Pl. LXXV.



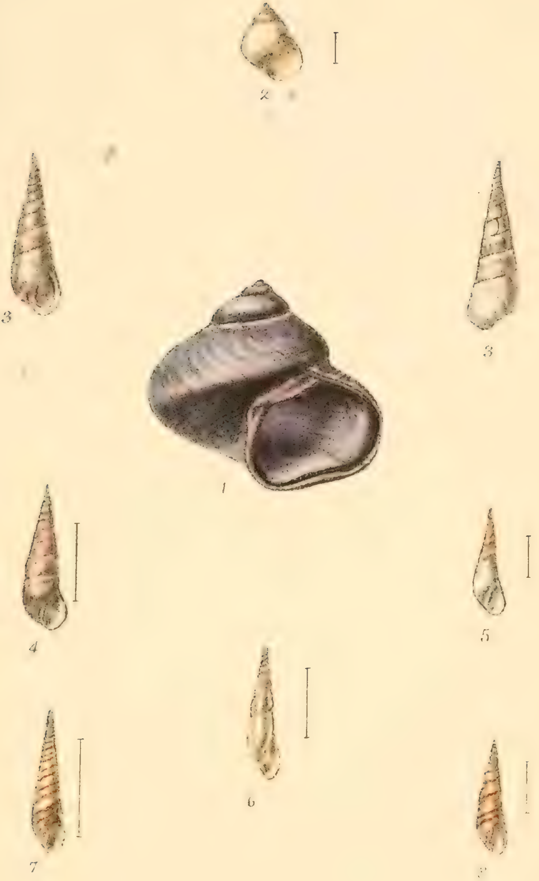
1. Odostomia indistincta 2. O. interstincta. 3. O. spiralis.
4. O. eximia 5. O. fenestrata. 6. O. excavata. 7. O. scalaris.
omp 8. do. var rufescens. G. B. Sowerby

Pl. LXXVI.



1. Odostomia rufa. 2. O. do. var. fulvocincta. 3. O. lactea
4. O. pusilla. 5. O. Scillæ. 6. O. acicula. 7. do. var. ventricosa.
8. O. nitidissima.

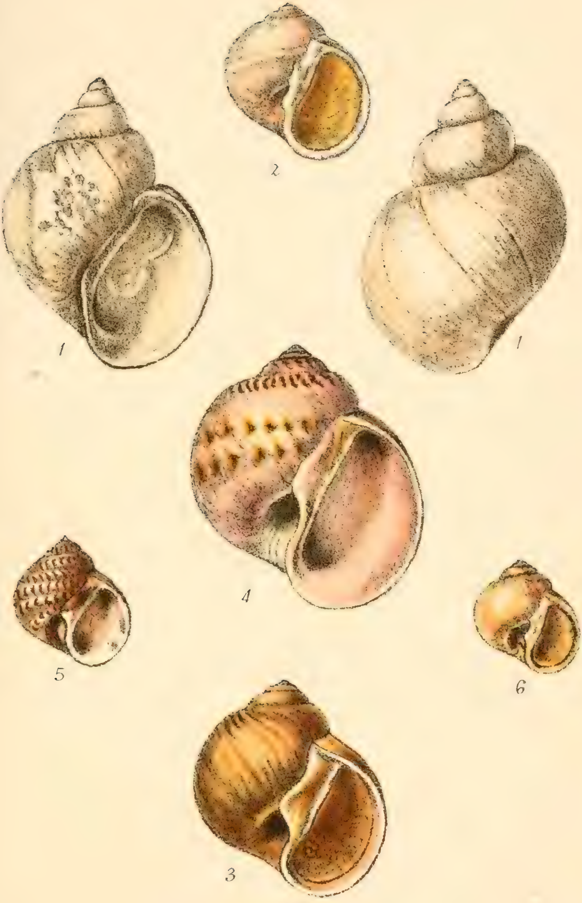
imp G. B. Sowerby



anthina rotundata. 2 Stilifer Turtoni. 3. Eulima polita. 4 E. intermedia
5 E. distorta. 6 E. stenostoma. 7 E. subulata. 8 E. bilineata

st, imp. G. B. Sowerby

Pl. LXXVIII.

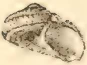


1. Natica Islandica. 2. N. Grœnlandica. 3 N. sordida.
4. N. catena 5. N. Alderi. 6. N. Montacuti.

West. imp

G. B. Sowerby

Pl. LXXIX.



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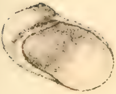

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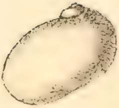

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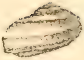

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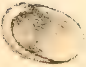

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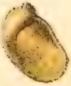

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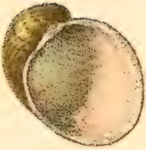

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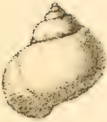

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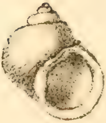

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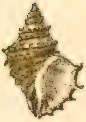


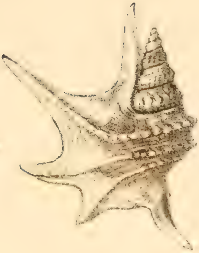
6

eorbis subcarinatus. 2. Lamellaria perspicua. 2. a. d° var.
planata. 3 Velutina plicatilis. 4 V. lævigata. 5. Torellia
vestita. 6. Trichotropis borealis.

mp.

G.B. Sowerby.

Pl. LXXX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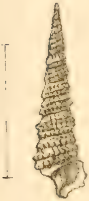
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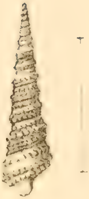
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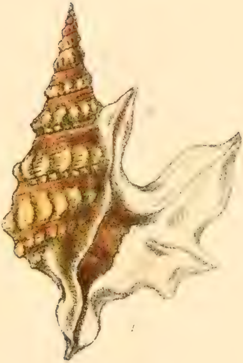

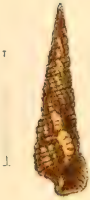
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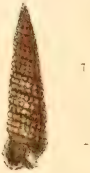
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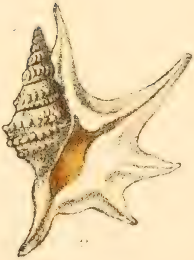

2

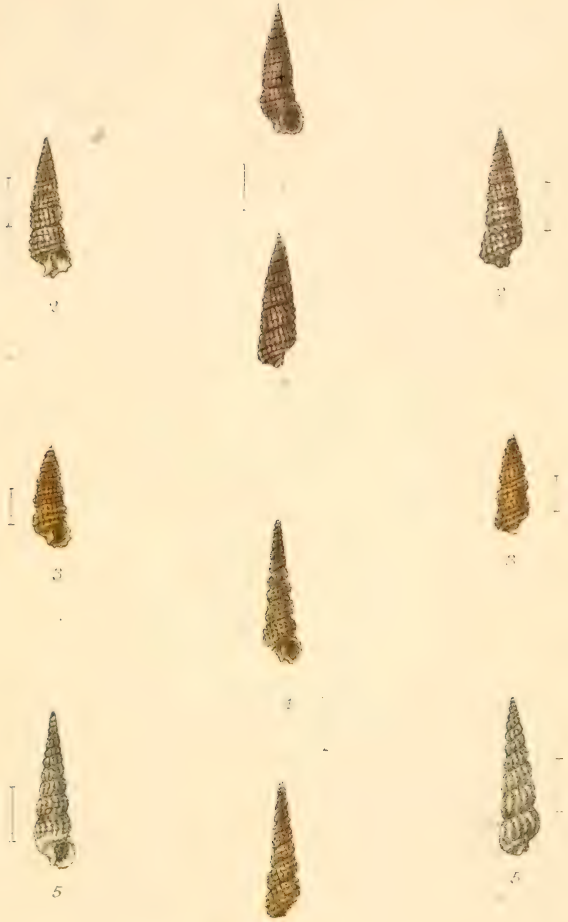
1. *Aporrhaïs pes-pelecani.* 2. *A. Macandreæ.*

3. *Cerithium metula.* 4. *C. reticulatum.* 5. *C. perversum.*

st imp.

G.B. Sowerby.

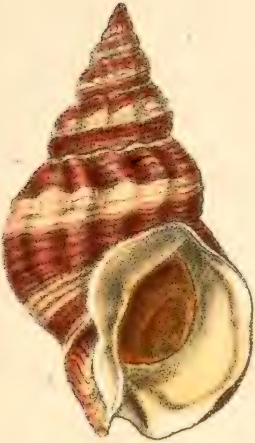
Pl. LXXXI

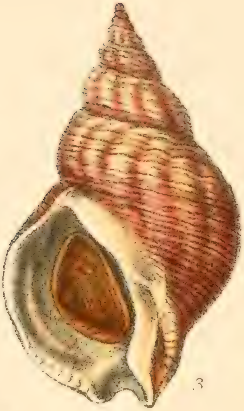


1 *Cerithiopsis tubercularis.* 2. *C. Barleei* 3. *C. pulchella.*
4. *C. Metaxa.* 5. *C. costulata.*

West imp.

G.B. Sowerby





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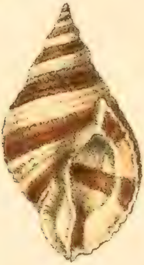

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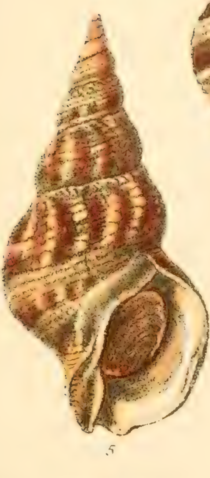

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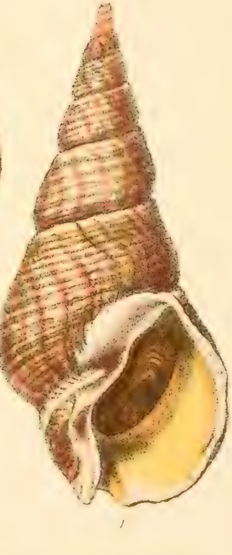
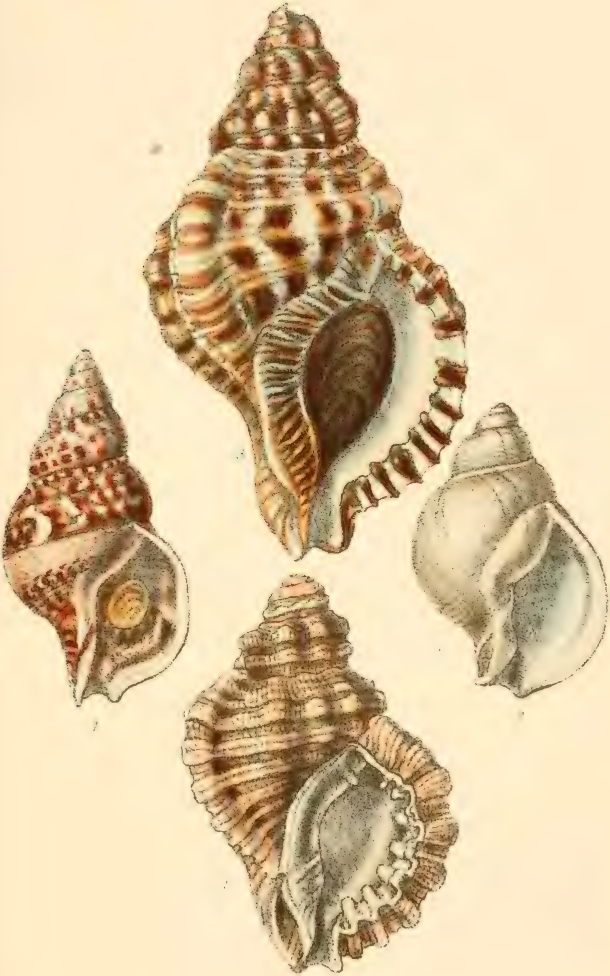


1. Purpura lapillus. 2. Buccinum undatum

3. d° monstr. sinistrorsum. 4. d° monstr. acuminatum.

5. d° var. Zetlandica

West imp. G. B. Sowerby

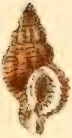


1 Buccinum Humphreysianum. 2. Buccinopsis Dalei

3. Triton nodifer. 4 T. cutaceus

W. West imp G. B. Sowerby

Pl. LXXXIV.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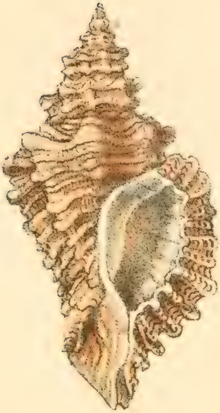
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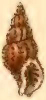
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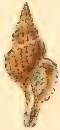
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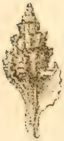
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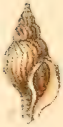

6

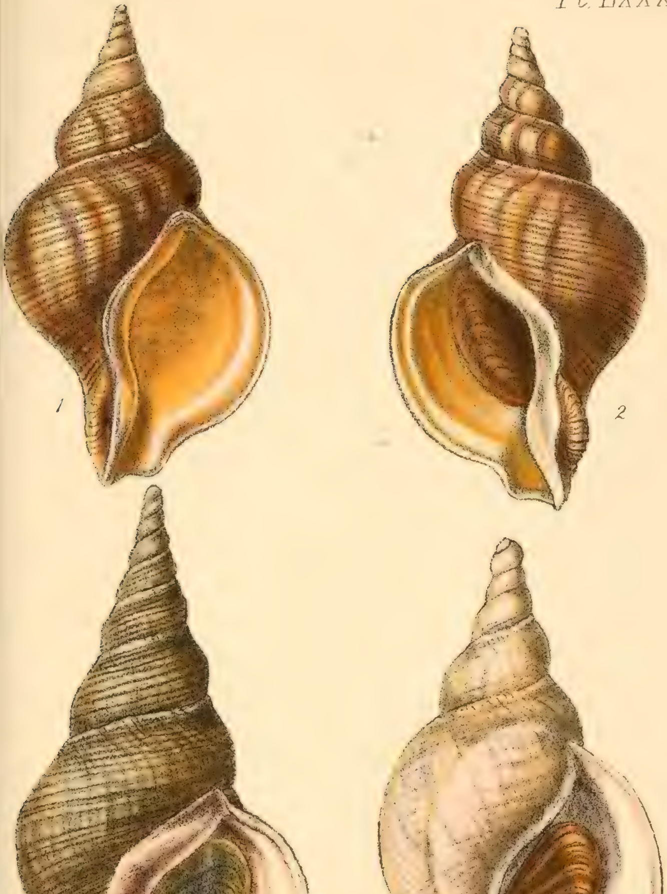
1. *Murex erinaceus* 2. *M. aciculatus.* 3. *Lachesis minima.*

4. *Trophon muricatus.* 5. *T. Barvicensis.* 6. *T. truncatus.*

G. B. Sowerby

West imp.

Pl. LXXXV

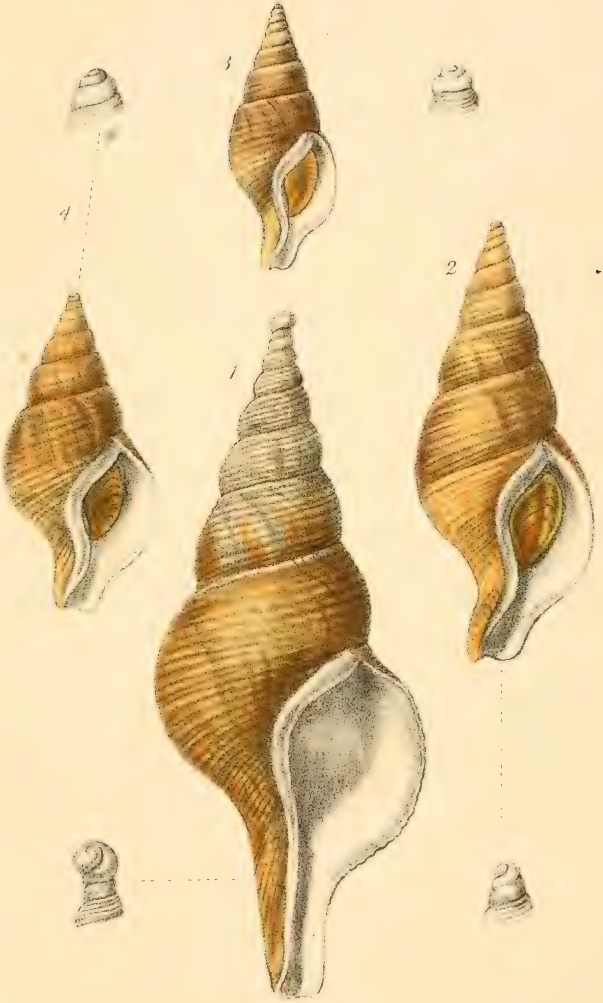


1. Fusus antiquus. 2. d°. monstr. contrarium

3. F. Norvegicus. 4. F. Turtoni

West imp.
G.B. Sowerby

Pl. LXXXVI.

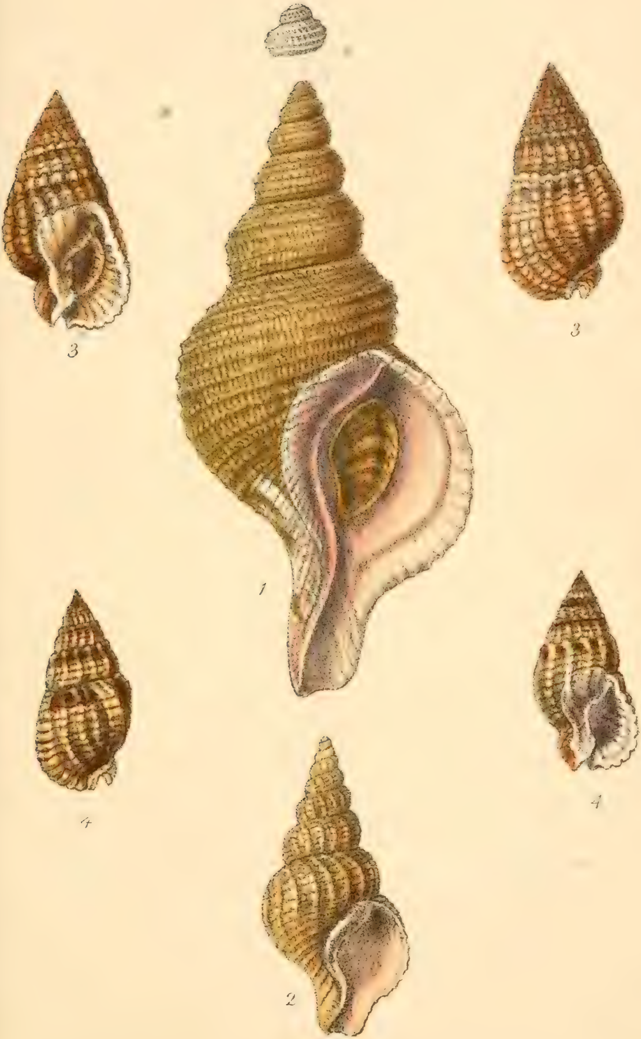


1. Fusus Islandicus. 2. F. gracilis. 3. F. propinquus.
4. F. buccinatus

West, imp.

G. B. Sowerby

Pl. LXXXVII.

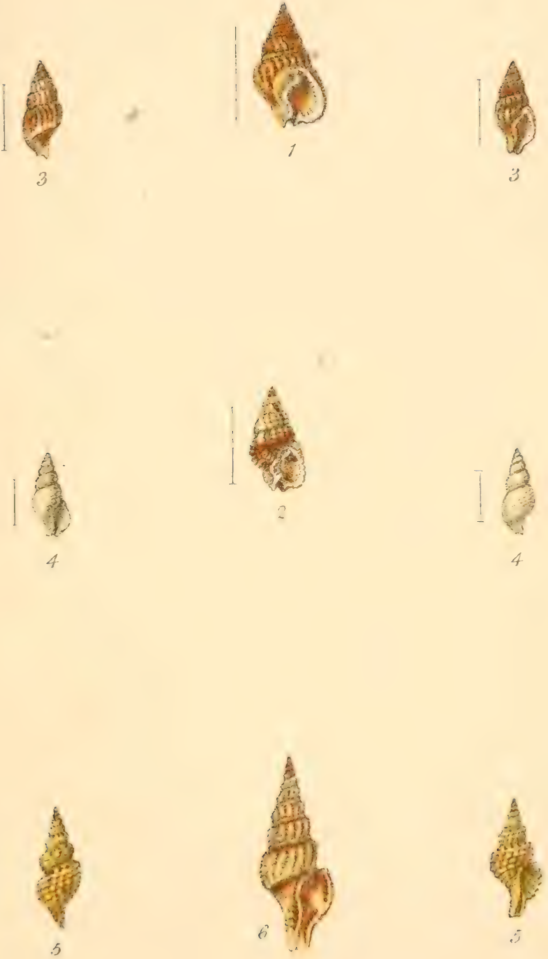


1. Fusus Berniciensis. 2. F. fenestratus.

3. Nassa reticulata. 4. N. nitida.

V. West, imp. G. B. Sowerby.

Pl. LXXXVIII.

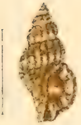


Nassa incrassata. 2. N. pygmæa. 3. Columbella haliæeti.
4. C. nana. 5. Defrancia teres. 6. D. gracilis.

G. B. Sowerby

West, imp.

Pl. LXXXIX.



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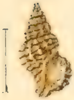

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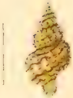

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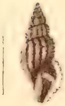

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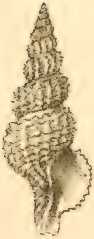

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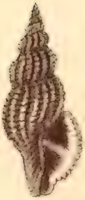

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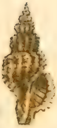
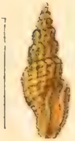


3

1 *Defrancia Leufroyi.* 2. *D. linearis.* 3. *D reticulata.*

4. *D° var. formosa.* 5. *D. purpurea.* 6. *D° var. oblonga.*

est, imp. G. B. Sowerby.



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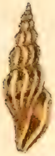

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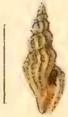

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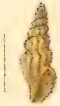

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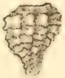
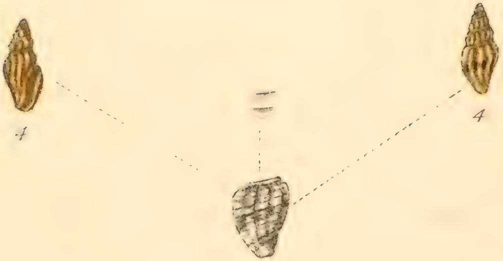




4

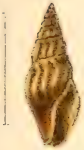
4

1 Pleurotoma striolata. 2. P. attenuata. 3. P. costata.
4. P. rugulosa. 5. P. brachystoma.

West, imp

G. B. Sowerby

Pl. XCI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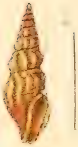
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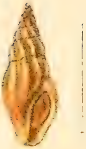
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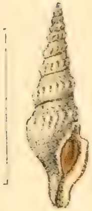
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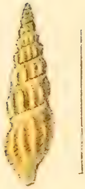
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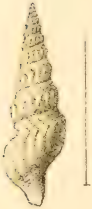
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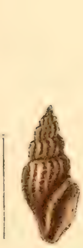
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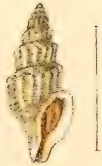
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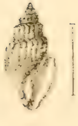
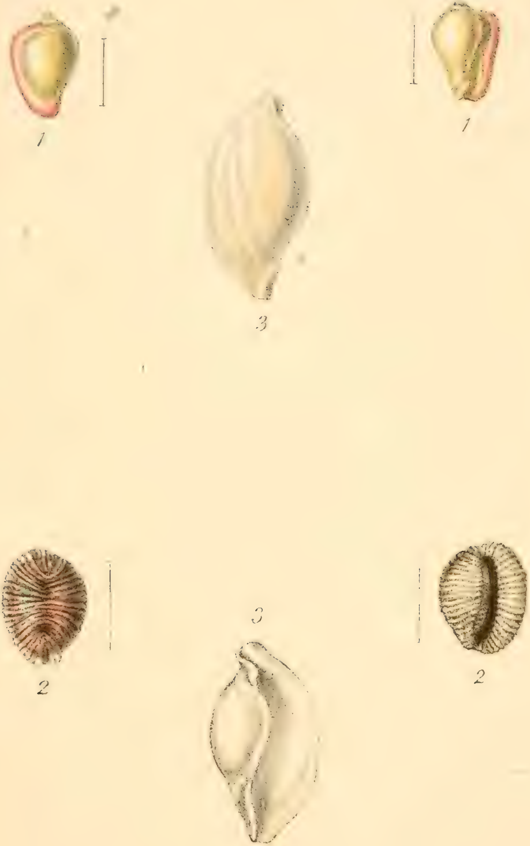

8

1 Pleurotoma nebula. 2. Dº var elongata. 3. P. lævigata.

4 P. nivalis. 5 P. septangularis 6. P. rufa. 7. P. turricula.

West imp. 8. P. Trevelyana. G. B. Sowerby

Pl. XCII.

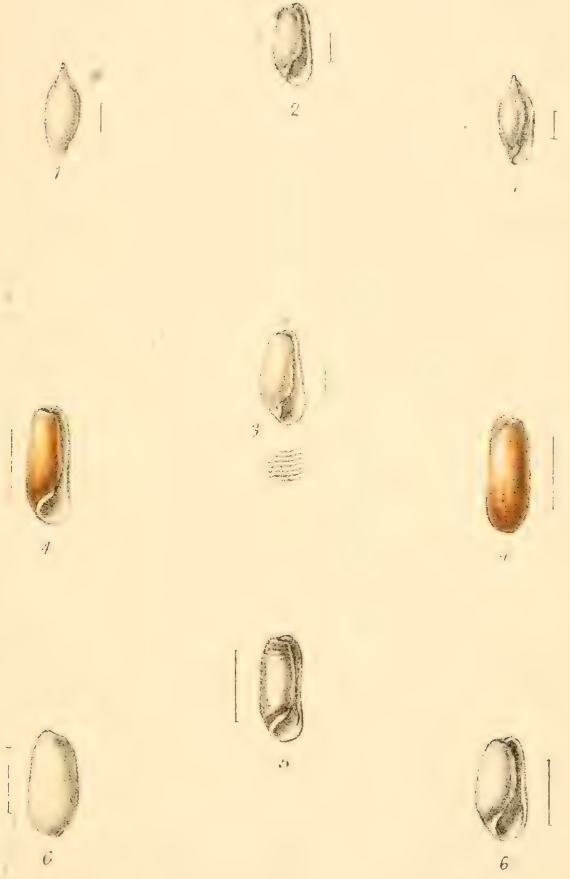


1. Marginella lœvis 2. Cypræa Europœa 3 Ovula patula

W West, imp.

G B Sowerby

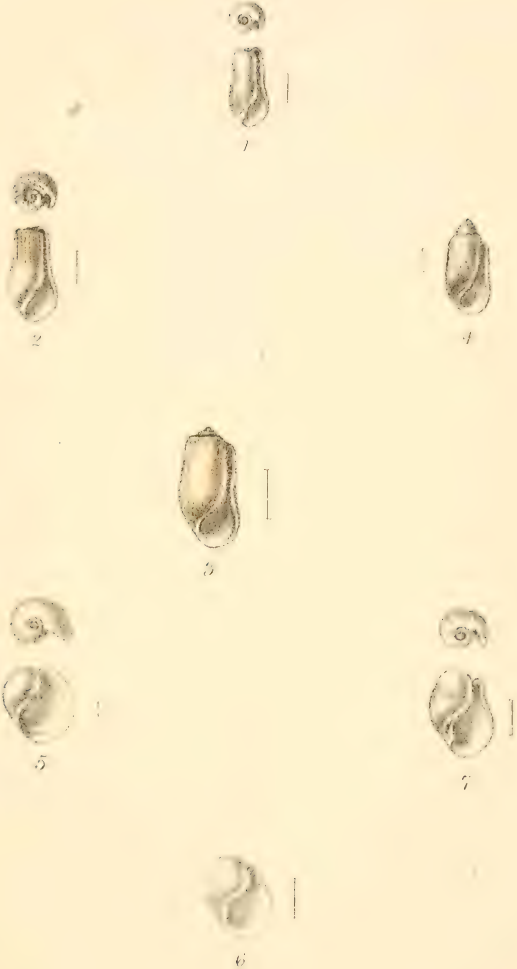
Pl. XCIII



1. *Cylichna acuminata.* 2 *C. nitidula* 3 *C. umbilicata.*

4. *C. cylindracea.* 5. D°. *var linearis.* 6. *C. alba.*

West. imp.
G. B. Sowerby

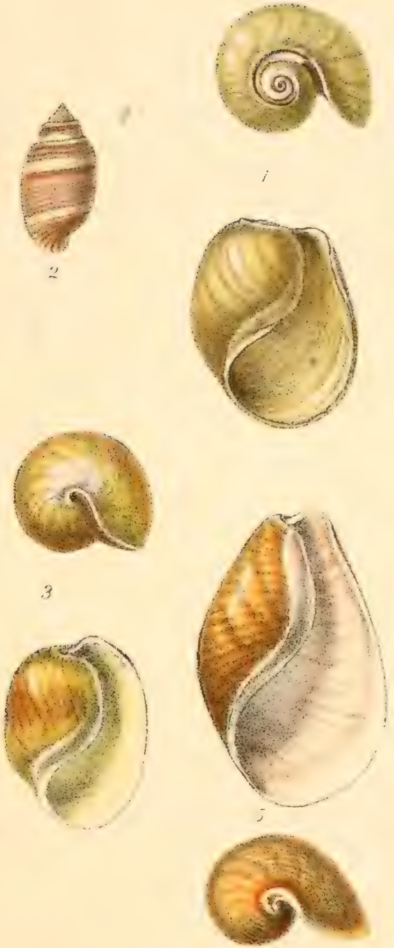


1 Utriculus mammillatus 2. U. truncatulus 3. U. obtusus

4. D^o. var. Lajonkairianus 5. U. ventrosus 6. U. expansus

7. U. hyalinus.

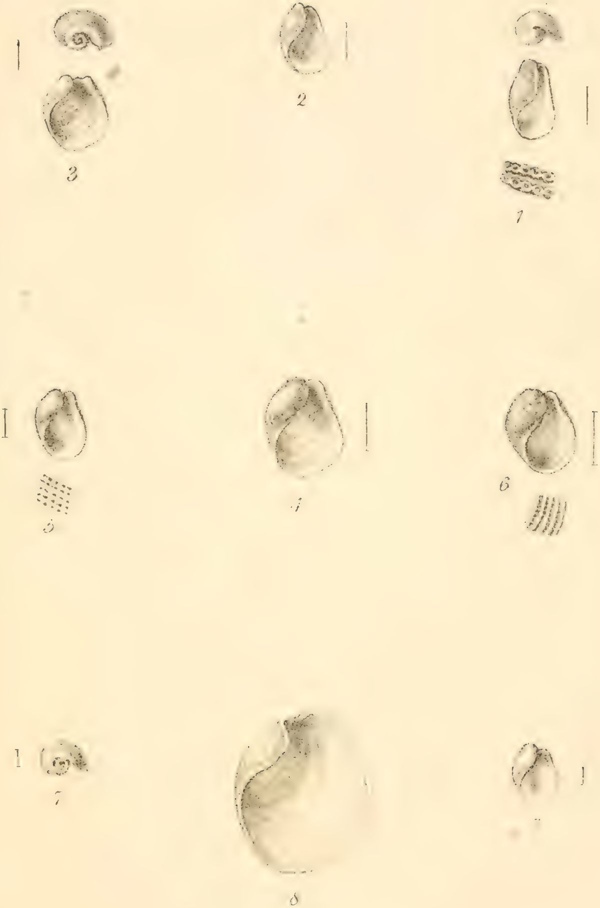
West . imp. G. B. Sowerby



1. Acera bullata. 2. Actæon tornatilis. 3. Bulla hydatis.
4. B. utriculus. 5. Scaphander lignarius.

imp

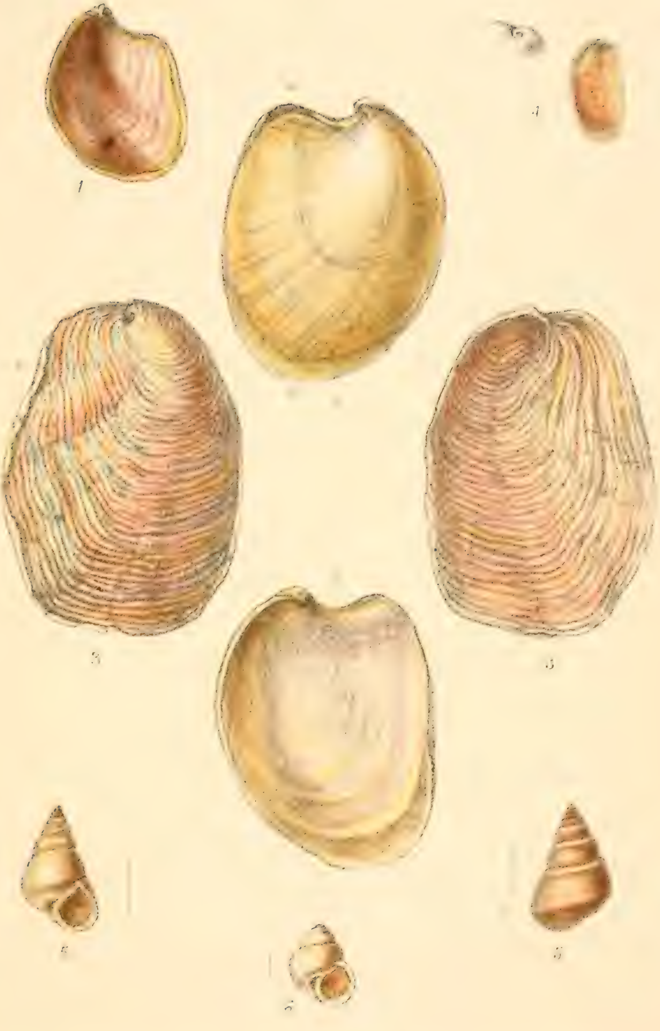
G. B Sowerby



1. *Philine scabra.* 2 *P. catena.* 3 *P. angulata.* 4 *P. quadrata.*
5 *P. punctata.* 6 *P. pruinosa.* 7 *P. nitida.* 8. *P. aperta.*

West, imp.
G. B. Sowerby

Pl. XCVII

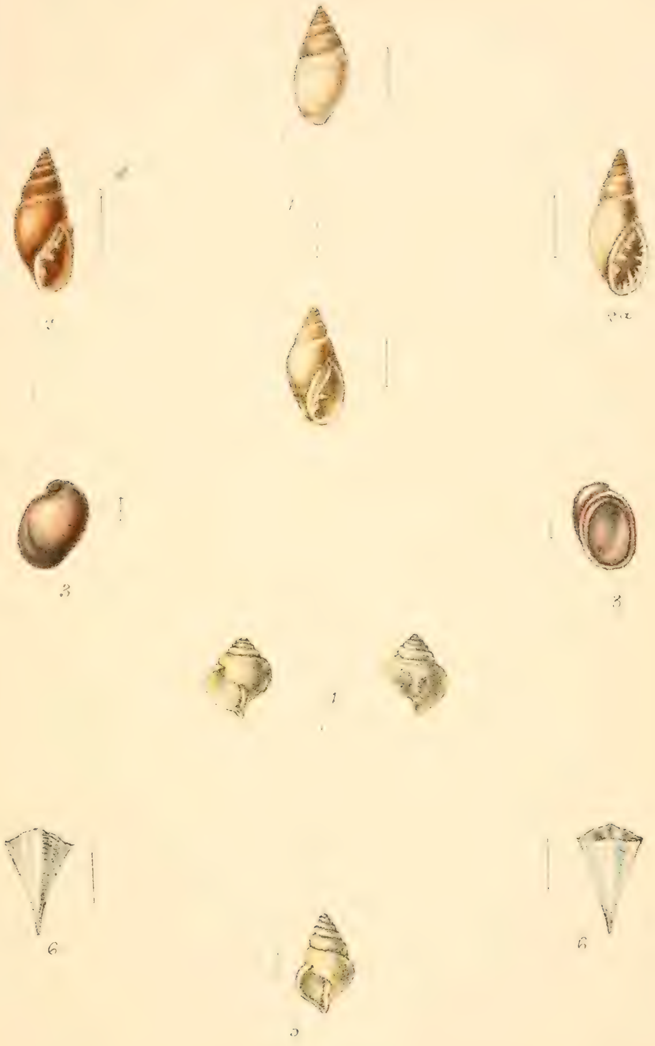


1. *Aplysia punctata.* 2. *A. depilans.* 3, *Pleurobranchus membranaceus.* 4, *P. plumula.* 5. *Assiminea Grayana.* 6. *A. litorina.*

W. West imp.

G. B. Sowerby

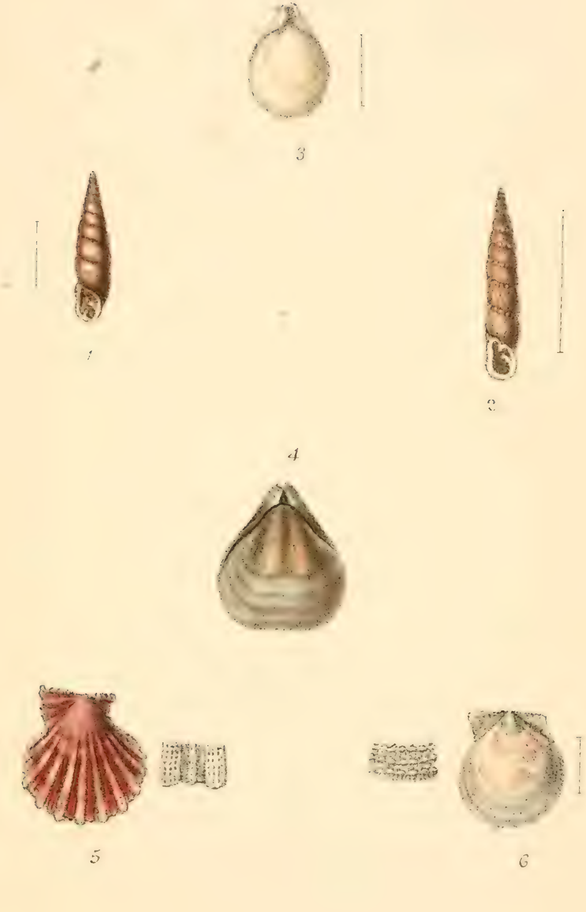
Pl. XCVIII.



1, Melampus bidentatus. 2. M. myosotis. 2a do. var. ringens. 3, Otina otis. 4. Spirialis retroversus. 5, do. var. Macandrew. 6. Clio pyramidata.

W. West imp. G. B. Sowerby

Pl. XCIX.



1, Clausilia parvula. 2. C. solida. 3. Terebratella Spitzbergensis. 4, Rhynchonella psittacea 5, Pecten aratus. 6. P. vitreus.

W. West imp.
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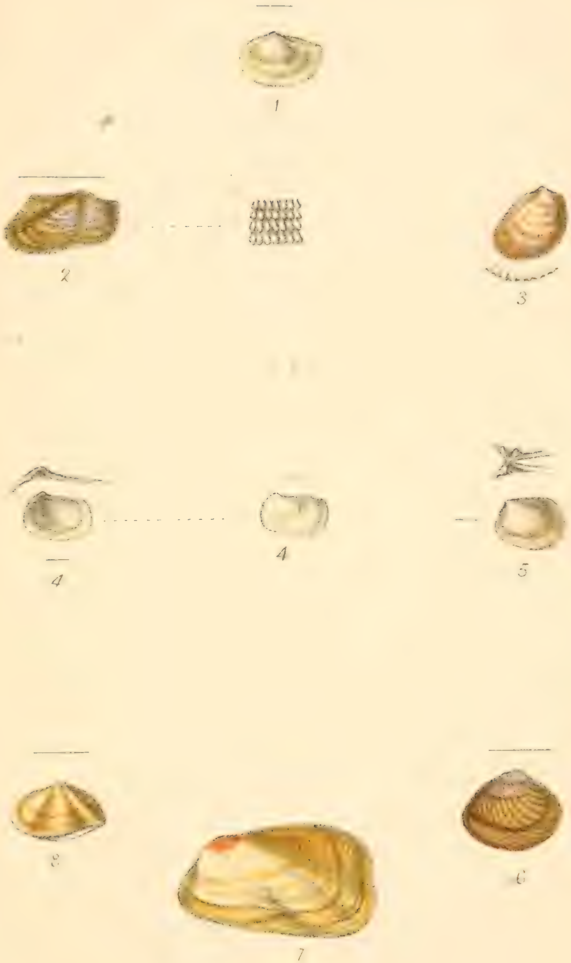
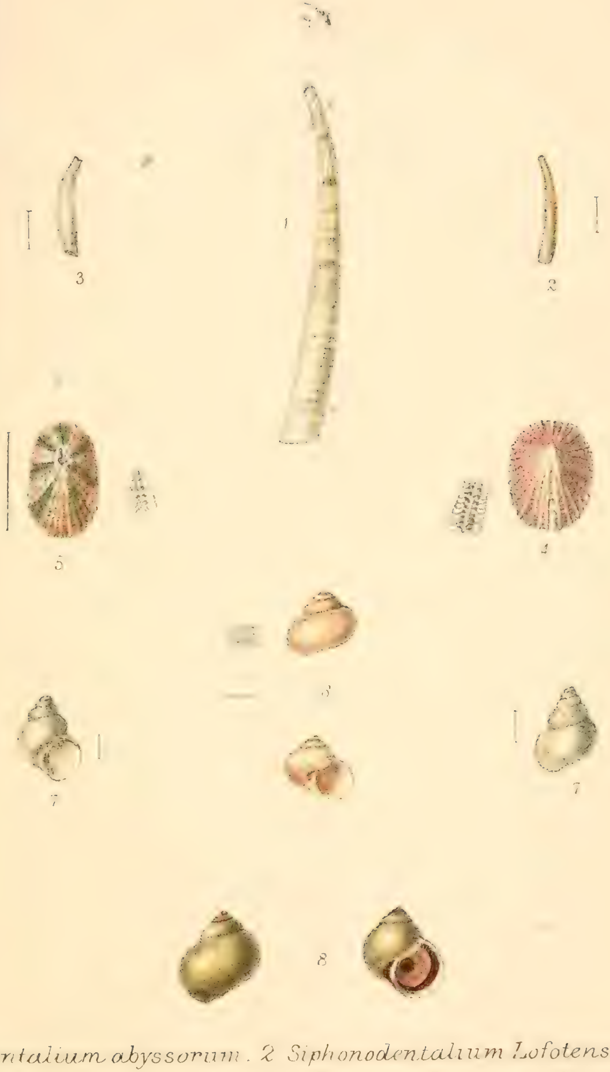
Pl. C.



1 Leda lucida 2. Arca nodulosa 3 Limopsis borealis.
4. Montacuta donacina. 5. M. tumidula 6. Woodia digitaria
7. Cypricardia lithophagella. 8. Corbula Mediterranea

West imp.
G.B. Sowerby

Pl. CI.

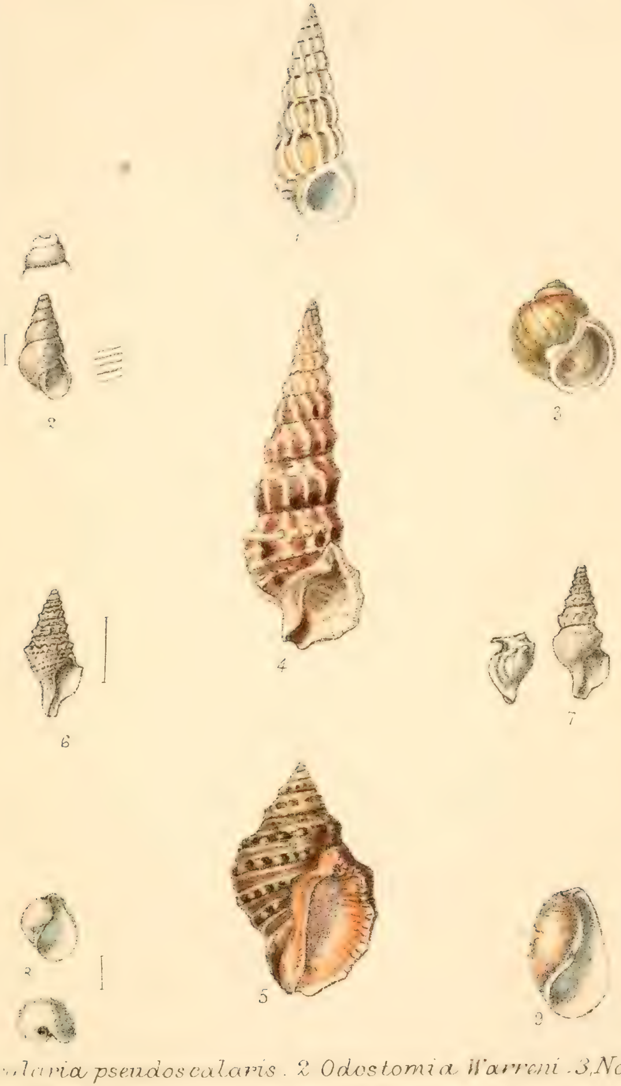


1 Dentalium abyssorum. 2 Siphonodentalium Lofotense.
3. Cadulus subfusiformis. 4 Emarginula cancellata.
5. Fissurella gibba. 6 Trochus glaucus. 7. Lacuna tenella.
8. Littorina æstuarii.

West imp.

G.B Sowerby

Pl. CII.



1. *Scalaria pseudoscalaris.* 2 *Odostomia Warreni.* 3, *Natica affinis.* 4, *Cerithium vulgatum.* 5, *Purpura hæmastoma.* 6 *Pleurotoma galerita.* 7, *P carinata.* 8, *Utriculus globosus* 9. *Scaphander librarius.*

West imp

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